ORDER NO. PAES 970104C6

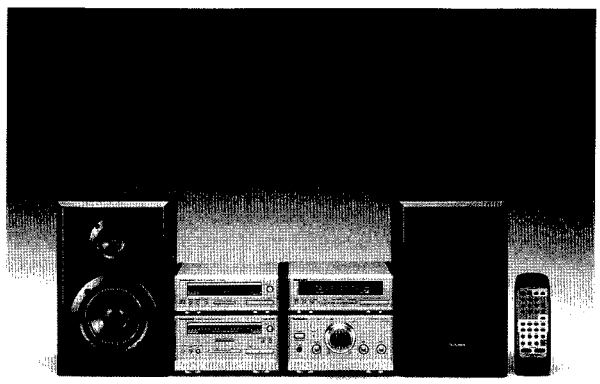
Service Manual

Speaker System
SB-HD50A

Colour

(M)	...	Brown Type

Hi-Fi Speaker System



SPECIFICATIONS

Type	2-way 2-speaker system
Speakers	Woofer: 12 cm cone type
	Tweeter: 6 cm cone type
Impedance	6 Ω
Input Power	60W, (Music)
	30W (DIN)
Output Sound Pressure Level	85 dB/W (1,0 m)
Crossover Frequency	2,5 kHz
Frequency Range	45 Hz ≈ 30 kHz (-16 dB)
	55 Hz ≈ 26 kHz (-10 dB)
Dimensions (W x H x D)	190 x 297 x 216 mm
Weight	3,6 kg

Note:
Design and specifications are subject to change without notice.

ESPECIFICACIONES

Tipo	Sistema de 2 vías con 2 altavoces
Altavoces	Graves: tipo cónico de 12 cm
	Agudos: tipo cónico de 6 cm
Impedancia	6 Ω
Capacidad de potencia	60W (Musicales)
	30W (DIN)
Nivel de presión acústica de salida	85 dB/W (1,0 m)
Frecuencia de cruce	2,5 kHz
Respuesta de frecuencias	40 Hz ≈ 30 kHz (-16 dB)
	55 Hz ≈ 26 kHz (-10 dB)
Dimensiones (W x H x D)	190 x 297 x 216 mm
Peso	3,6 kg

Nota:
Estas especificaciones están sujetas a cualquier cambio sin previo aviso.

SPECIFICATIONS

Type	2-voies 2-haut-parleurs
Haut-parleurs	Graves: 12 cm type a cone
	Aigus: 6 cm type cone
Impédance	6 Ω
Entrée maximale	60W, (Musique)
	30W (DIN)
Niveau de pression sonore de sortie	85 dB/W (1,0 m)
Fréquence de conmutation	2,5 kHz
Gamme de fréquences	45 Hz ≈ 30 kHz (-16 dB)
	55 Hz ≈ 26 kHz (-10 dB)
Dimensions (W x H x D)	190 x 297 x 216 mm
Poids	3,6 kg

Note:
Subject à changement sans preavis.

⚠ WARNING

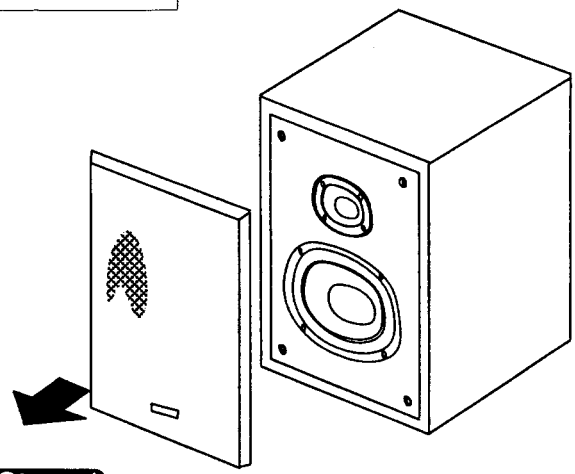
This service information is designed for experienced repair technnicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non technical individuals of potential dangers in attempting toservice product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could serult in serious injury or death.

Technics®

© 1997 Panasonic Spain S.A.
All rights reserved. Unauthorized copying and distribution is a violation of law.

DISASSEMBLY INSTRUCTIONS

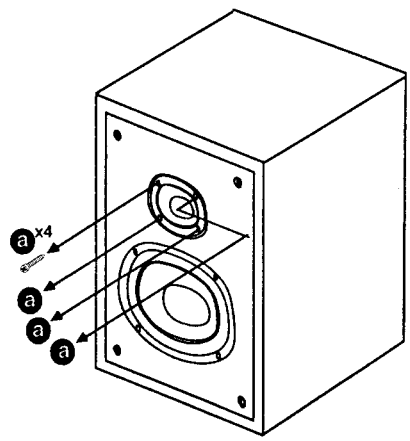
Ref. No. 1	Removal of the Speaker Net
Procedure 1	



Step 1

- Remove the Speaker Net in the direction of arrow.

Ref. No. 2	Removal of the Speaker Tweeter
Procedure 1 → 2	

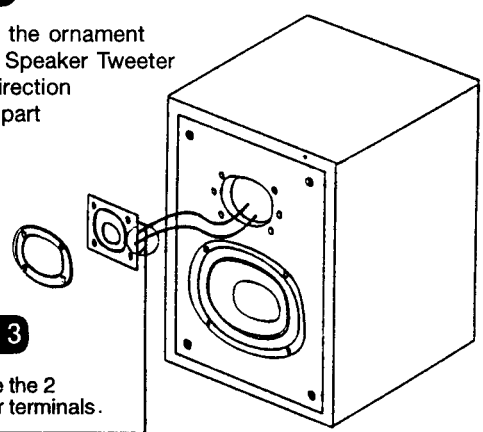


Step 1

- Remove the 4 screws.

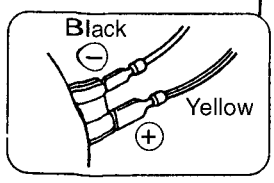
Step 2

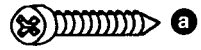
- Remove the ornament and the Speaker Tweeter in the direction of front part



Step 3

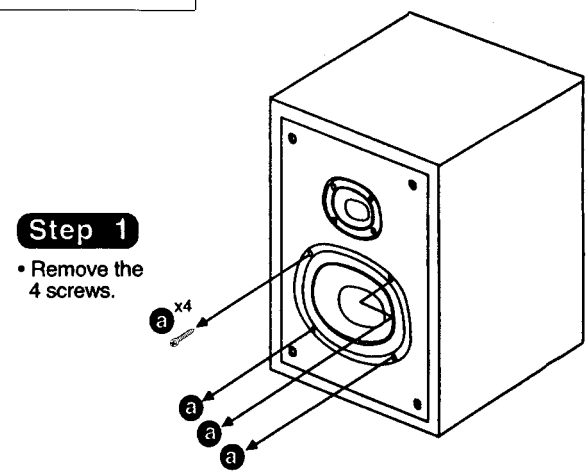
- Remove the 2 Speaker terminals.





Screw Ø 4,2 x 20 mm

Ref. No. 3	Removal of the Speaker Woofer
Procedure 1 → 3	

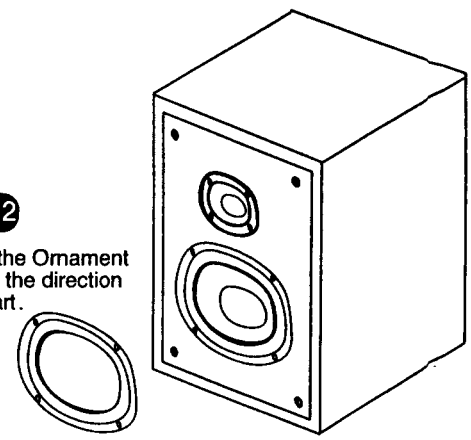


Step 1

- Remove the 4 screws.

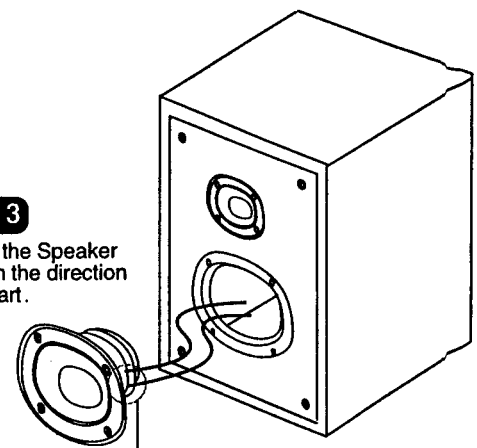
Step 2

- Remove the Ornament Woofer in the direction of front part.



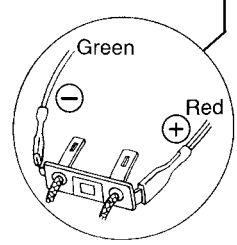
Step 3

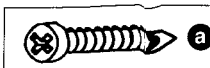
- Remove the Speaker Woofer in the direction of front part.



Step 4

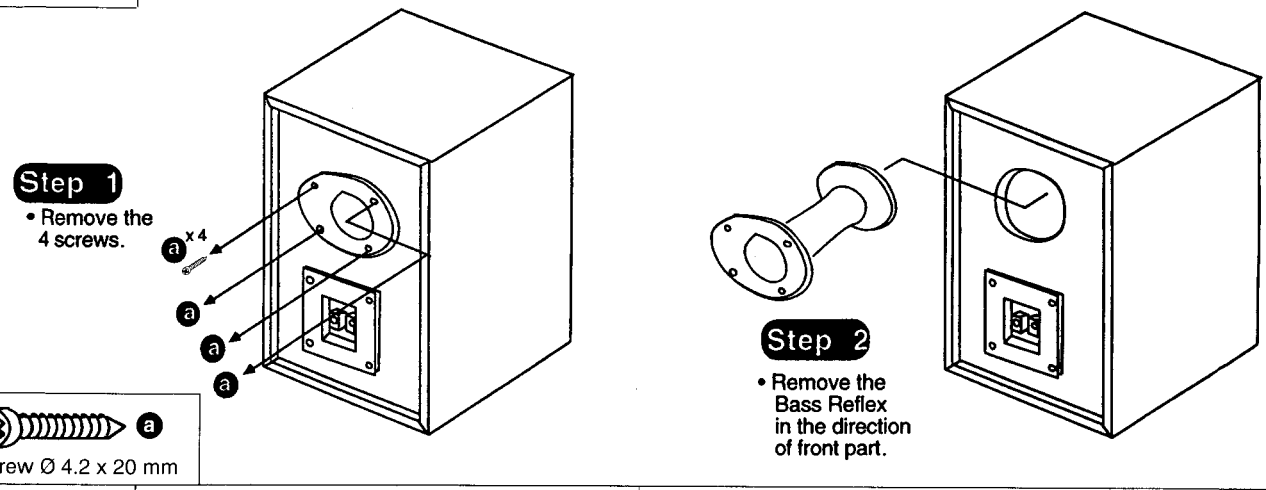
- Remove the 2 Speaker terminals.





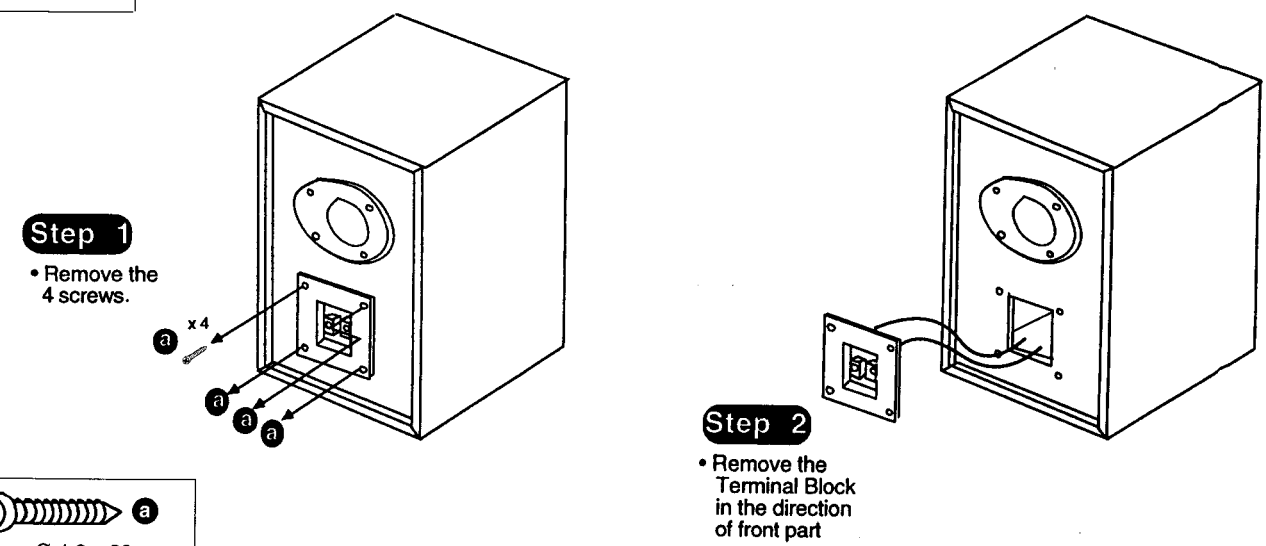
Screw Ø 4,2 x 20 mm

Ref. No. 4	**Removal of the Bass Reflex**
Procededure 4	



a
Screw Ø 4.2 x 20 mm

Ref. No. 5	**Removal of the Terminal Block**
Procededure 5	

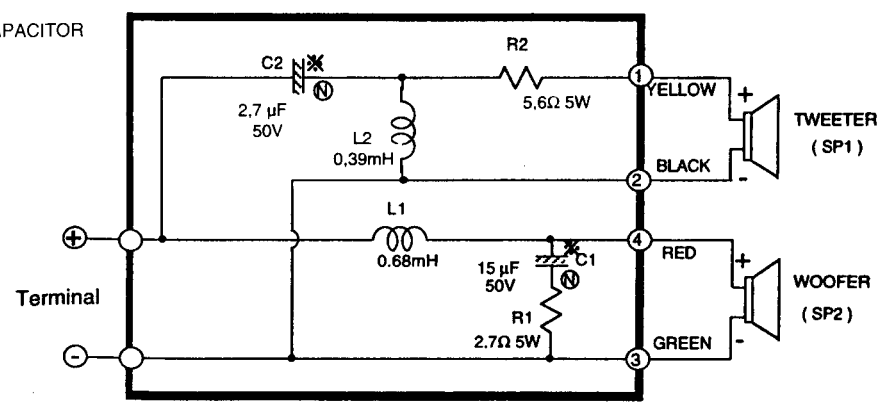


a
Screw Ø 4.2 x 20 mm

SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)
(Este esquema puede ser modificado en cualquier momento con el desarrollo de nuevas tecnologías.)

※ Ⓝ NON-POLAR CAPACITOR



REPLACEMENT PARTS LIST

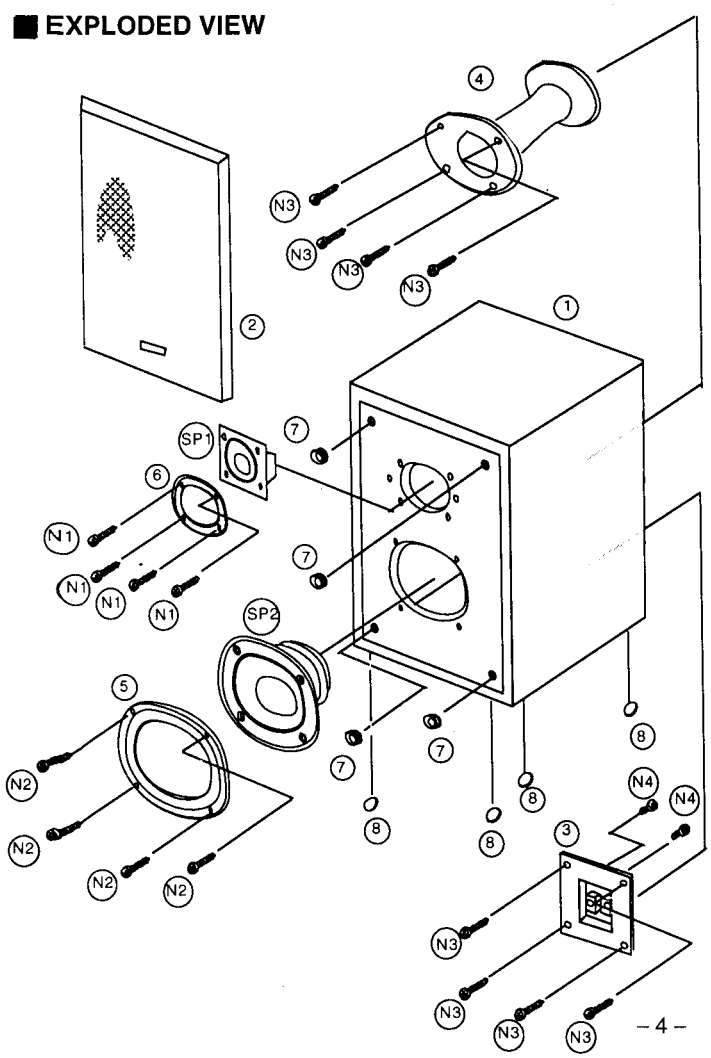
Notes : 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. PAES indicates parts that are supplied by PAES.
3. A D indicates parts that are supplied by AD. M.E.I.

Notas : 1. El código está indicado en la mayoría de las piezas. Por favor, use este código para sus pedidos.
2. La indicación PAES isignifica recambios suministrados a través de PAES.
3. La indicación A D significa recambios suministrados a través de AD. M.E.I.

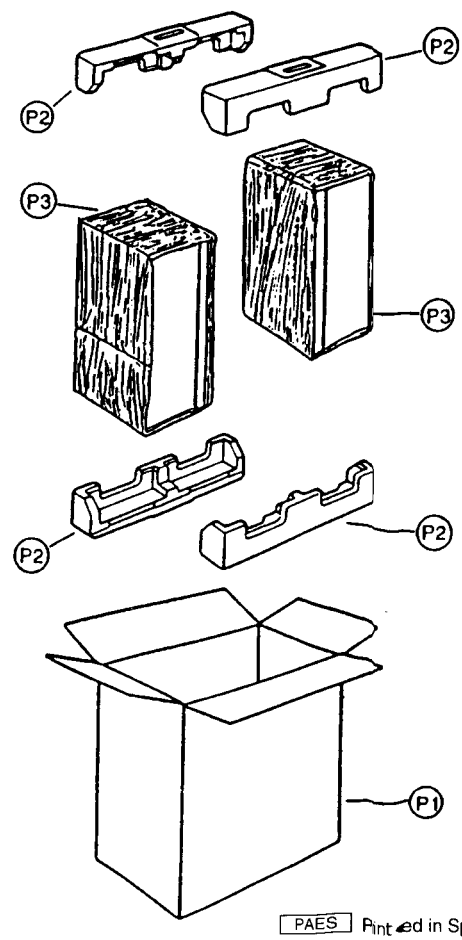
Ref. No.	Part No.	Part Name & Description	Remarks
		SPEAKER (S)	
SP1	EAST6PH01B6	SPEAKER (TWEETER)	PAES
SP2	EAS12PL339A6	SPEAKER (WOOFER)	PAES
		COIL (S)	
L1	SLCP681J	CHOQUE COIL 0,68 mH	PAES
L2	SLCP391J	CHOQUE COIL 0,27 mH	PAES
		CAPACITOR (S)	
C1	ECEA50Y15KE	NON-POLAR CAPACITOR 15µF 50V	PAES
C2	ECEA50Y2R7KE	NON-POLAR CAPACITOR 2,7µF 50V	PAES
		RESISTOR (S)	
R1	ERF5ZXK2R7	RESISTOR 2,7Ω 5W	A D
R2	ERF5ZXK5R6	RESISTOR 5,6Ω 5W	A D

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	SYMPHD50A	CABINET ASS'Y	PAES
2	SYBPHD50A	NET FRAME	PAES
3	SWEPHD50A	TERMINAL ASS'Y	PAES
4	SGES8G187-1	BASS REFLEX	PAES
5	RGKP0848-K	ORNAMENT WOOFER	PAES
6	RFK0919-K	ORNAMENT TWEETER	PAES
7	SHG8G9044	NET HOLDER	PAES
8	RKA8G0066-K	LEG	PAES
		SCREW (S)	
N1	XTNP42+20FG	SCREW SPEAKER TWEETER	PAES
N2	XTN42+20FG	SCREW SPEAKER WOOFER	PAES
N3	XTN42+20FG	SCREW BASS REFLEX/T. BLOCK	PAES
N4	XTBS42BZ+8	SCREW P.C.B.	PAES
		PACKING PARTS	
P1	SPGPHD50AM	CARTON BOX	PAES
P2	SPS8GBCH700	PAD	PAES
P3	SPH8G415	SHEET	PAES

EXPLODED VIEW



PACKAGING



PAES Printed in Spain
A97C109000XP

ORDER NO. AD9702017C2

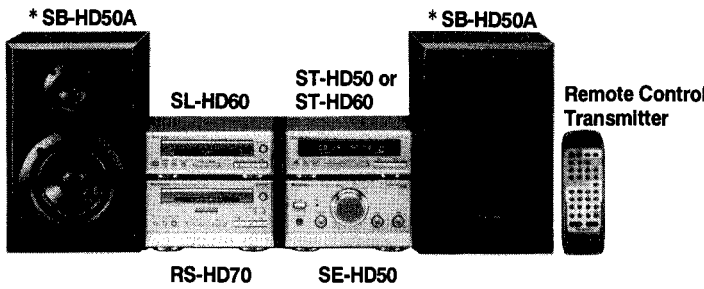
Service Manual

Amplifier

Amplifier

SE-HD50

System: SC-HD50



Colour

(N) ..... Gold

Areas

(E) ..... Europe
(EG) ..... Germany and Italy
(EB) ..... Great Britain
(EP) ..... East Europe and Russia

Because of unique interconnecting cables, when a compact requires service, send or bring in the entire system.

Specifications

Amplifier Section

Power output
DIN 1 kHz, THD 1 %, both channel driven: 2 × 23 W (6 ohm)
RMS 1 kHz, THD 10 %, both channel driven: 2 × 30 W (6 ohm)
Total harmonic distortion
Rated power at 1 kHz: 1 % (6 ohm)
Half power at 1 kHz: 0.09 % (6 ohm)
Load impedance: 6 ohm
S/N (rated power): 90 dB

General

Power consumption: 90 W
Power supply
[for (E, EG, EP) area]: 230 V, AC 50 Hz
[for (EB) area]: 230 – 240 V, AC 50 Hz
Dimensions: 196(W)/103(H)/255(D) mm
Weight: 3.5 kg

Notes:
1. Specifications are subject to change without notice.
2. Weight and dimensions are approximate.
3. Total harmonic distortion is measured by the digital spectrum analyzer.

System/SC-HD60:
Tuner: ST-HD50 or ST-HD60, Compact Disc Player: SL-HD60, **Amplifier: SE-HD50**, Cassette Deck: RS-HD70, Speakers: SB-HD50A
Notes: *..... Made in PAES

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

© 1997 Matsushita Electric Industrial Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

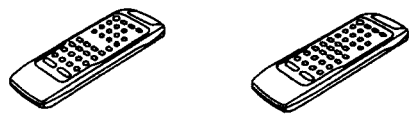
■ Contents

	Page
Accessories	2
Before Repair	2
Protection Circuitry	3
Caution for AC Main Lead	3
Location of Controls	4
Installation	4
Connections	5, 6
Changing the Tone	7
Convenient Functions	7
Operation Checks and Main Component Replacement Procedures	8 ~ 10
To Supply Power Source	11
Schematic Diagram	12~14
Printed Circuit Board Diagram	15~17
Type Illustration of ICs, Transistors and Diodes	16
Wiring Connection Diagram	17
Block Diagram	18
Replacement Parts List (Electrical)	19
Resistors and Capacitors	20
Replacement Parts List (Cabinet, Packing and Accessories)	21
Cabinet Parts Location	22
Packaging	23

■ Accessories

- AC power supply cord ..... 1 pc.
  For (EB) area (RJA0053-1X)
  For (E,EG,EP) area (RJA0019-2K)

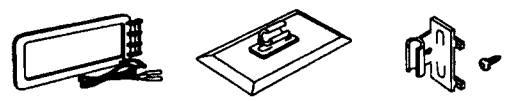
- Remote control transmitter ..... 1 pc.
  For (E, EB, EP) area (RAK-CH215WH)
  For (EG) area (RAK-CH193WH)



- Speaker cords ..... 2 pcs. (REE0393)

- Remote control batteries ..... 2 pcs.
  Note: These are available on sales route.

- AM loop antenna set (RSA0021)
  AM loop antenna ..... 1 pc.
  Antenna holder with stand ..... 1 pc.
  Antenna holder without stand ..... 1 pc.
  Screw ..... 1 pc.



- FM indoor antenna ..... 1 pc. (RSA0007)

- Antenna plug adaptor ..... 1 pc.
  For (EB) area only (SJP9009)

- Flat cable (Long thick) ..... 1 pc. (REX0812)

- Flat cable (Long thin) ..... 1 pc. (REX0813)

- Flat cable (short) ..... 1 pc. (REX0608)

■ Before Repair

(1) Turn off the power supply. Using a 10 Ω, 10 W resistor, connect both ends of power supply capacitors (C701, C702) in order to discharge the voltage.

(2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 230 V.

Area	(E) (EG) (EP)	(EB)
Power supply voltage	AC 230 V	AC 240 V
Consumed current 50 Hz	50 ~ 170 mA	50 ~ 170 mA

■ Protection Circuitry

The protection circuitry may have operated if either of the following conditions is noticed:

* No sound is heard when the power is switched ON.
* Sound stops during a performance.

The functions of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.
If this occurs, follow the procedure outlined below:

1. Switch OFF the power.
2. Determine the cause of the problem and correct it.
3. Switch ON the power once again.

Note:
When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

■ Caution for AC Main Lead

[(EB) area code model only]

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ⓚ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

CAUTION!
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFETY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

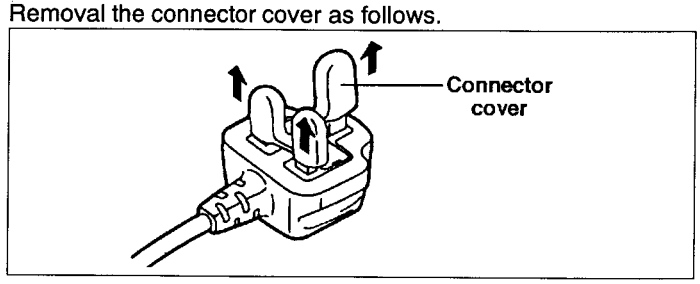
This apparatus was produced to BS 800.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

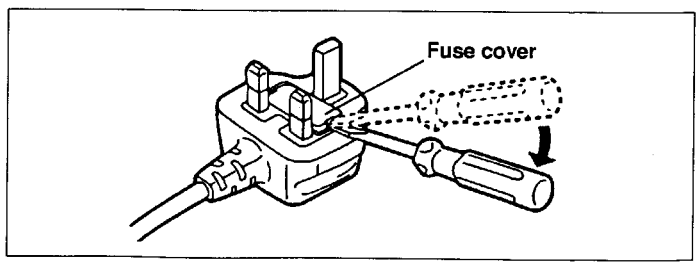
Before use

Removal the connector cover as follows.

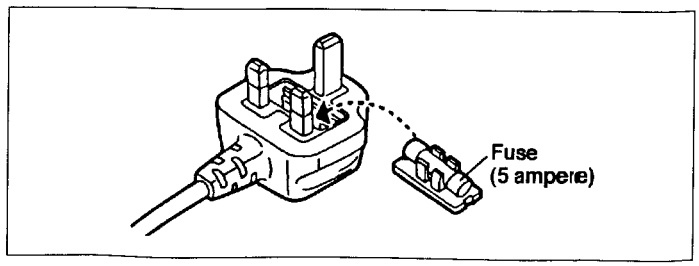


How to replace the fuse

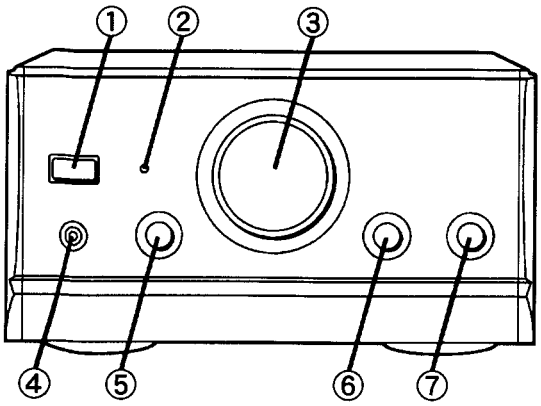
1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



■ Location of Controls



① **Power "STANDBY ⏻/ON" switch (POWER, STANDBY ⏻/ON)**
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

② **Standby indicator (STANDBY)**
When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is terned on.

③ **Volume control (VOLUME)**

④ **Headphones jack (PHONES)**

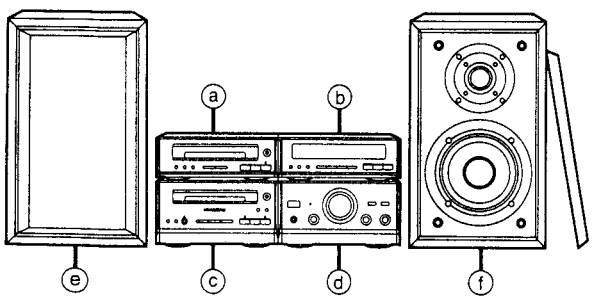
⑤ **Balance control (BALANCE)**

⑥ **Bass control (BASS)**

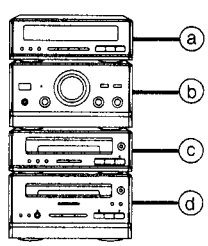
⑦ **Treble control (TREBLE)**

■ Installation

A



B



Locating the components

Side-by-side set-up A

ⓐ CD player
ⓑ Tuner
ⓒ Cassette deck
ⓓ Amplifier
ⓔ Left speaker
ⓕ Right speaker

Stacking B

ⓐ CD player
ⓑ Tuner
ⓒ Cassette deck
ⓓ Amplifier

Caution:
Use the speakers only with the recommanded system. Failure to do so many lead to the amplifier and/or the speakers, and may result in the risk of fire.
Consult a qualified service person if damage has occured or if you experience a sudden in performance.

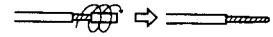
Note

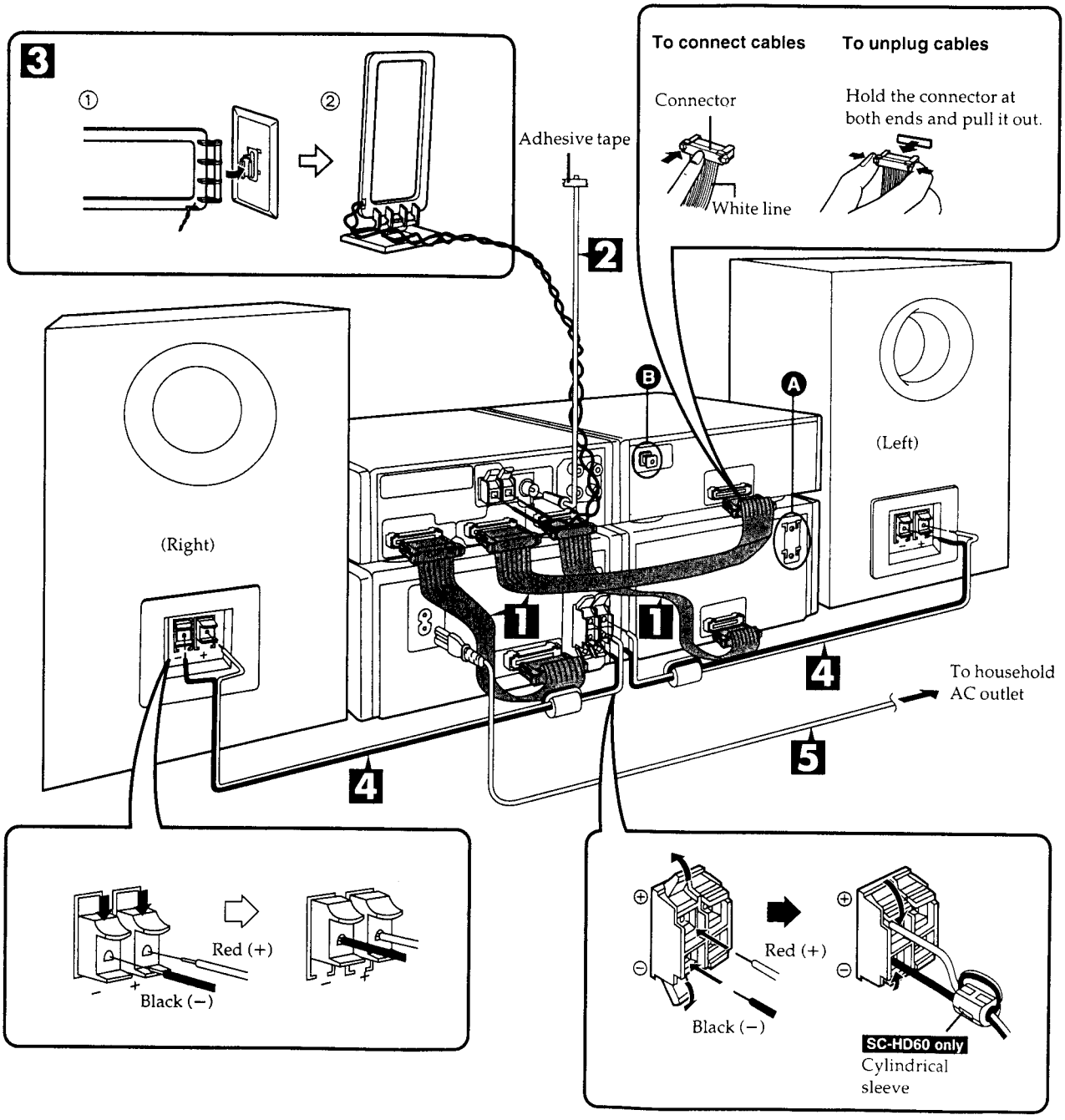
Left and right speakers are exactly the same.

■ Connections

Connect the AC mains lead after you have connected all other cables.

To prepare the AM loop antenna wire and speaker cords, twist the vinyl cover tip and pull off.





1 Connect the flat cables.

1. Connect the short flat cable between the terminals A1 and A2.
2. Connect the long thick flat cable between the terminals B1 and B2.
3. Connect the long thin flat cable between the terminals C1 and C2.

Note

Do not try connecting or disconnecting the flat cables while the power is switched to ON.

After connection:

Keep cables as flat against the back of the unit as possible.

2 Connect the FM indoor antenna.

Tape the antenna to a wall or column, in a position where radio signals are received with the least amount of interference.

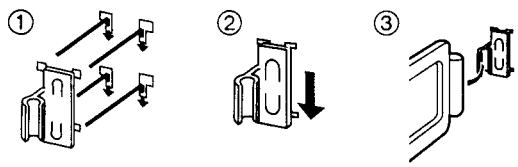
Note

When you cannot get a good reception with this FM indoor antenna, we recommend you install an FM outdoor antenna (not included).

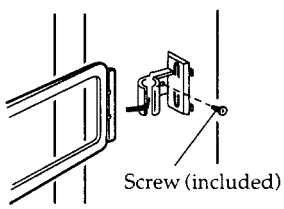
3 Connect the AM loop antenna.

You can also install the AM loop antenna on the rear of the cassette deck, wall or pillars.
In this case, be sure to use the antenna holder with the hole.

•To install on the cassette deck rear (Ⓐ)



•To install on walls or pillars



Note

To minimize noise pickup, bundle the loop antenna cord using a tape or so to keep the flat cables away from the AM loop antenna cord.

4 Connect the right (R) and left (L) front speaker cables.

Note

- For SC-HD60 connect the end of the speaker cable with the cylindrical sleeve to the amp side.
- To prevent damage to circuitry, never short-circuit positive (+) and negative (−) speaker wires.
- Be sure to connect only positive (red) wires to positive (+) terminals and negative (black) wires to negative (−) terminals.

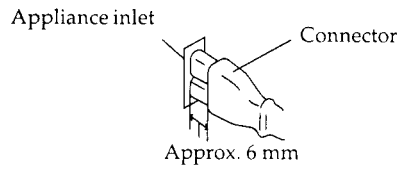
These speakers are made so as to be able to be used in close proximity to the TV, but irregular coloring may result due to how the system is placed. If such distortion occurs, turn off the TV for sometime between 15 and 30 minutes. The demagnetizing function of the TV will eliminate the distortion. If the irregular coloring is still visible, then move the speaker further away from the TV. Please note that if there is a magnetic object near the TV, irregular coloring may result due to the interaction between the TV and the speakers.

5 Connect the AC mains lead.

(United Kingdom only)
BE SURE TO READ THE CAUTION FOR AC MAINS LEAD ON PAGE 4 BEFORE PROCEEDING TO STEP 5.

Insertion of Connector

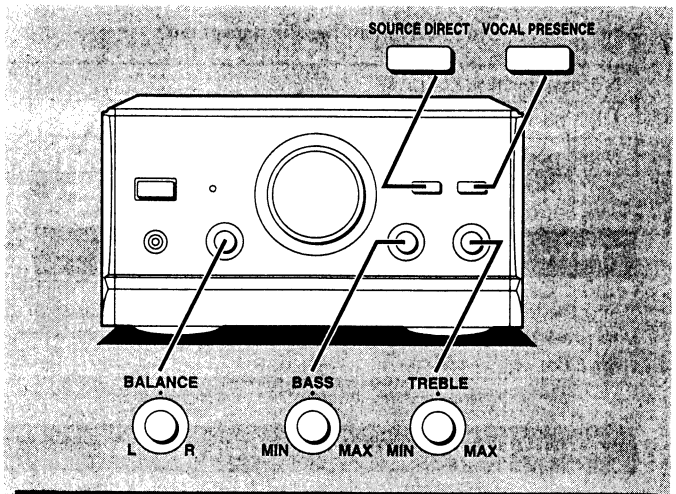
Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing.
However there is no problem using the unit.

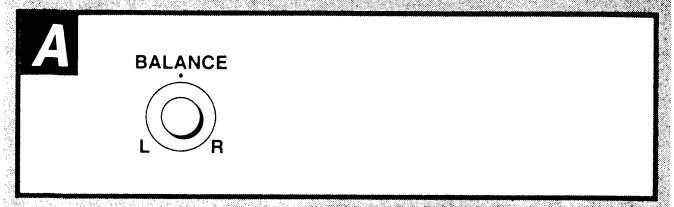


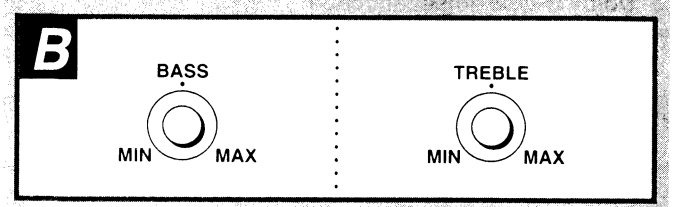
Connections to "DIGITAL OPTICAL OUT" terminal: (Ⓑ)

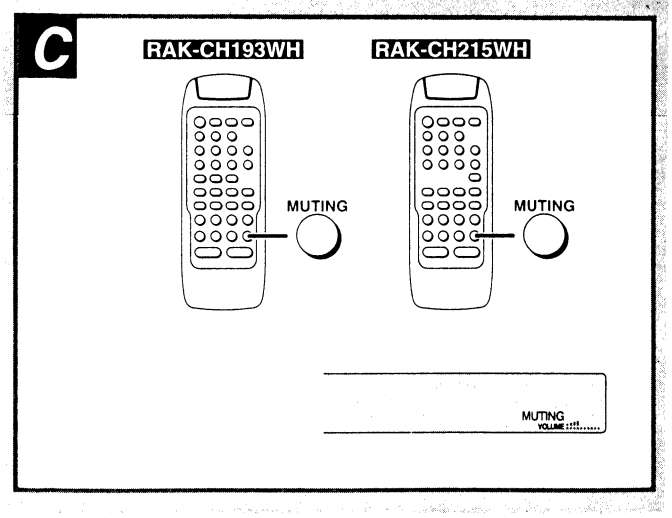
Before using this terminal, take out the dust protection cap.
Connect an optical-fiber cable to the optical input terminal of the DCC or minidisc deck (cables and components not included).

■ Changing the Tone









To adjust the sound balance

A

Turn BALANCE to adjust the left/right sound balance.

Note

The effect works only with playback. It cannot be used in recording.

To adjust the tone quality

B

Turn BASS to adjust the low-frequency sound.

Turn TREBLE to adjust the high-frequency sound.

Note

The effect works only with playback. It cannot be used in recording.

■ Convenient Functions

To mute the volume

C

This feature is convenient when you have a telephone call, etc.

by remote control only

Press MUTING.

"MUTING" will light.

To cancel, press MUTING once again. ("MUTING" goes out.)
To cancel from the amplifier, reduce the volume level to the minimum position (-- dB) and then reset to the desired volume.

For your reference:

When the system is turned off, the muting operation will be automatically canceled.

■ Operation Checks and Main Component Replacement Procedures

NOTE

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.**

• Contents

• Checking Procedures for each P.C.B. Page.

1.Checking for the operation P.C.B.. ..... 8,9.

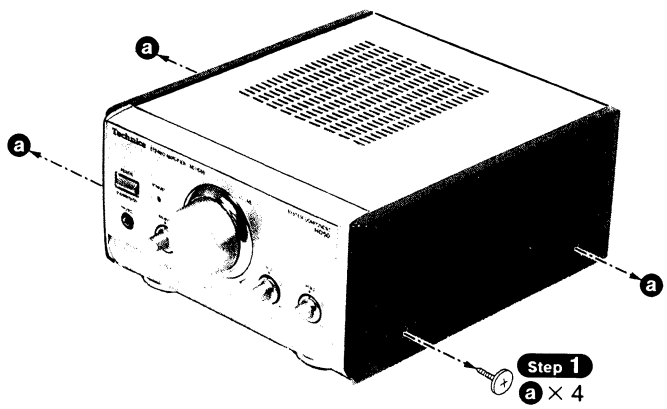
2.Checking for the protection P.C.B. and main P.C.B.. ..... 9,10.

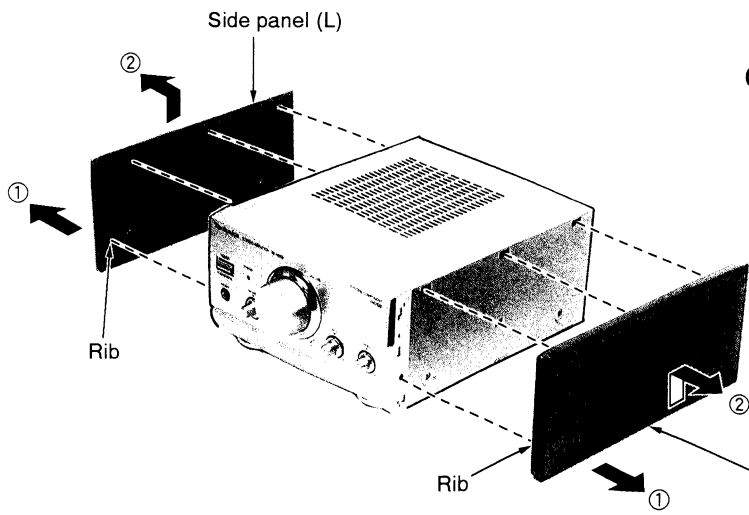
• Main Component Replacement Procedures

1. Replacement for the power IC. ..... 10.

■ Checking Procedure for each P.C.B.

1. Checking for the operation P.C.B.

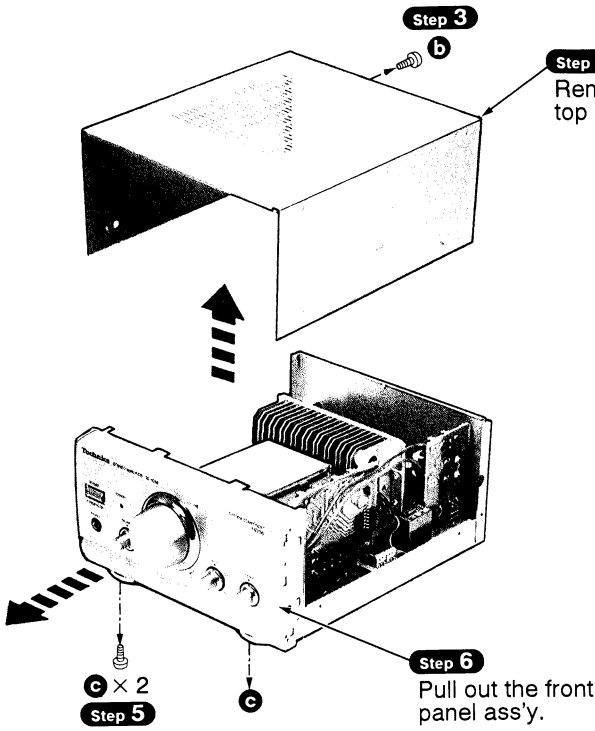




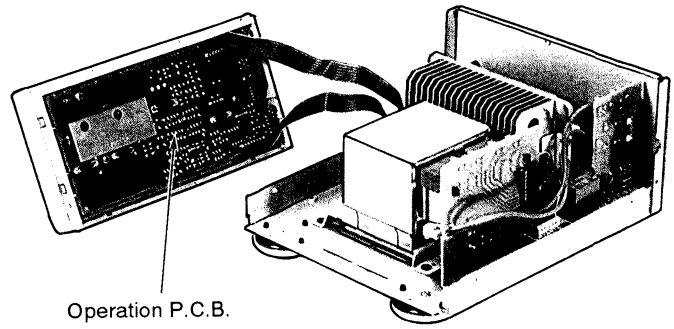
Step 2

Remove the side panel (L),(R).

• Spread the lower part of the side panels in the direction of arrow (➡①) to release the ribs, and then lift to remove the side panels (➡②).



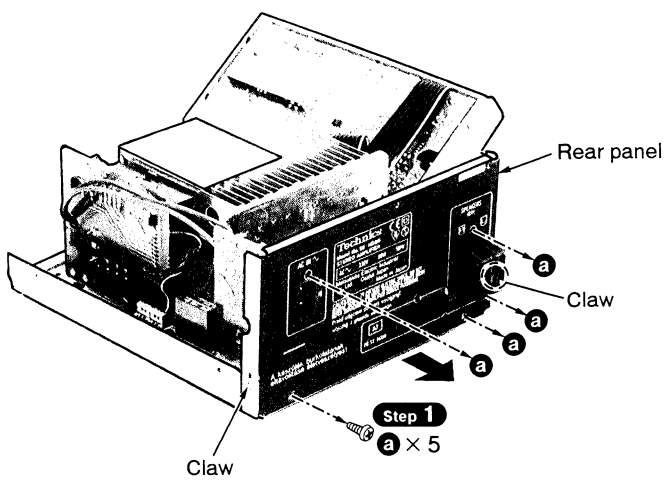
• **Check the operation P.C.B. as shown below.**

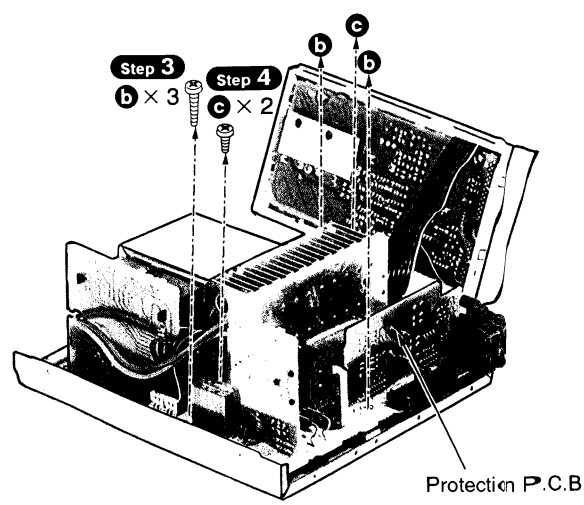


2. Checking for the protection P.C.B. and main P.C.B.

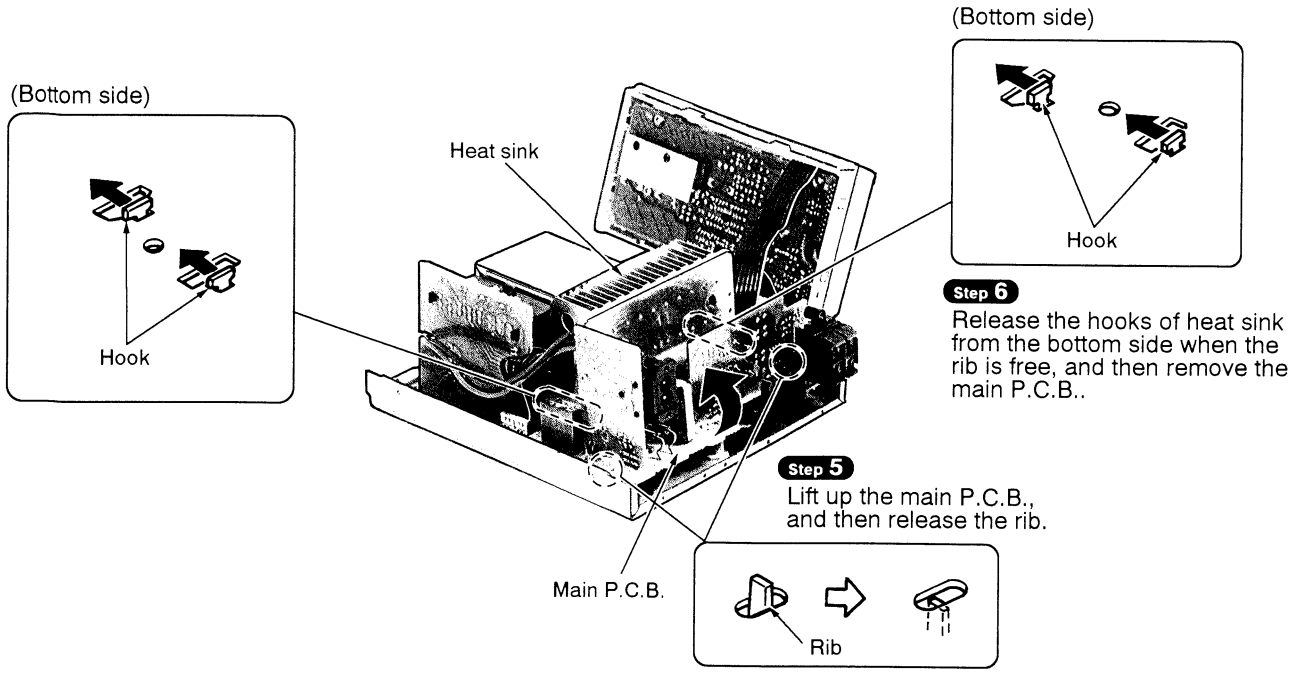
• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 8 and 9.

• **Check the protection P.C.B. as shown below.**

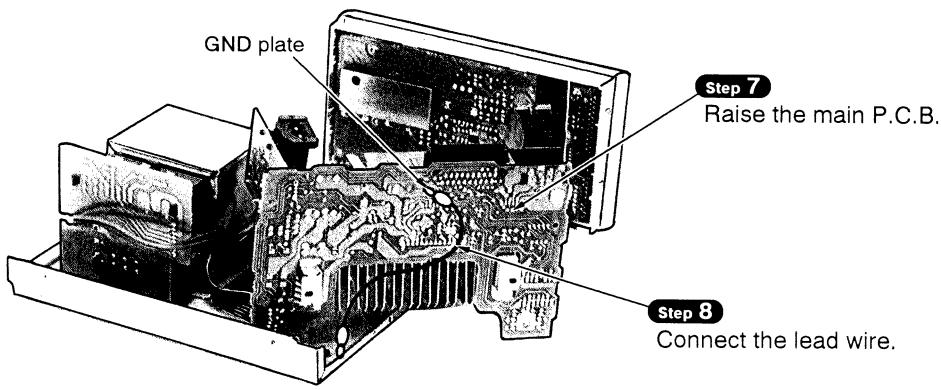




Step 2
Release the 2 claws, and then remove the rear panel.


(Bottom side)
Hook
Heat sink
(Bottom side)
Hook
Step 6
Release the hooks of heat sink from the bottom side when the rib is free, and then remove the main P.C.B..
Step 5
Lift up the main P.C.B., and then release the rib.
Main P.C.B.
Rib

• **Check the main P.C.B. as shown below.**

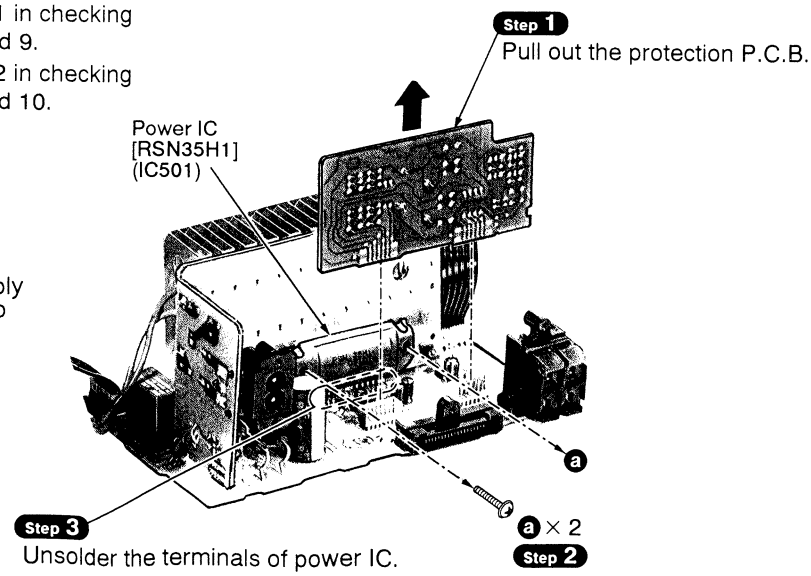


■ Main Component Replacement Procedures

1. Replacement for the power IC

• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 8 and 9.
• Follow the Step 1 ~ Step 6 of the item 2 in checking procedure for each P.C.B. on pages 9 and 10.

NOTE
When mounting the power IC apply silicone conpound (RFKX0002) to the rear side of power IC.



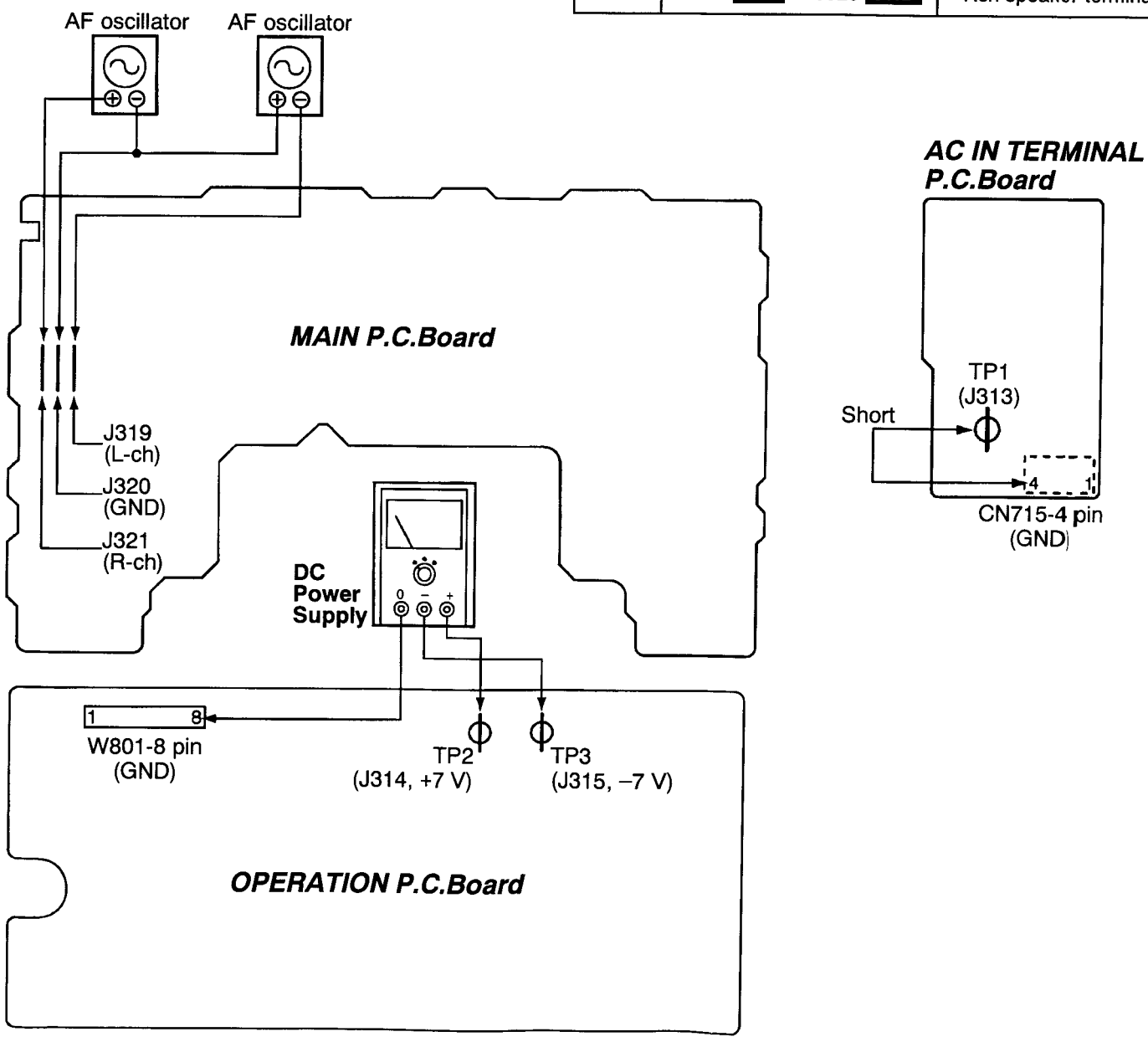
■ To Supply Power Source

1. **Short the section between the points TP1 (J313, +5 V) and CN715-4 pin (GND) on the AC IN TERMINAL P.C.Board.**
2. **Connect the DC Power Supply as shown below.**
   - **2-1. +7 V terminal of the DC Power upply connect to TP2 (J314).**
   - **2-2. GND terminal of the DC Power upply connect to W801-8 pin (D.GND).**
   - **2-3. –7 V terminal of the DC Power upply connect to TP3 (J315).**
3. **Connect this unit SE-HD50 to an AC outlet by the AC Power Cord.**

Operation Check

1. Set the unit to power ON mode.
2. Input a signal (1 kHz, 100 mV), and confirm it to be outputted from the speaker terminal.

	INPUT	OUTPUT
L-ch	J319 Lch ⇔ J320 GND	Lch speaker terminal
R-ch	J321 Lch ⇔ J320 GND	Rch speaker terminal



■ Schematic Diagram

Page
A HEADPHONES JACK CIRCUIT 13
B OPERATION CIRCUIT 13
C MAIN CIRCUIT 14
D PROTECTION CIRCUIT 14
E POWER TRANSFORMER CIRCUIT 14
F AC IN TERMINAL CIRCUIT 14

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

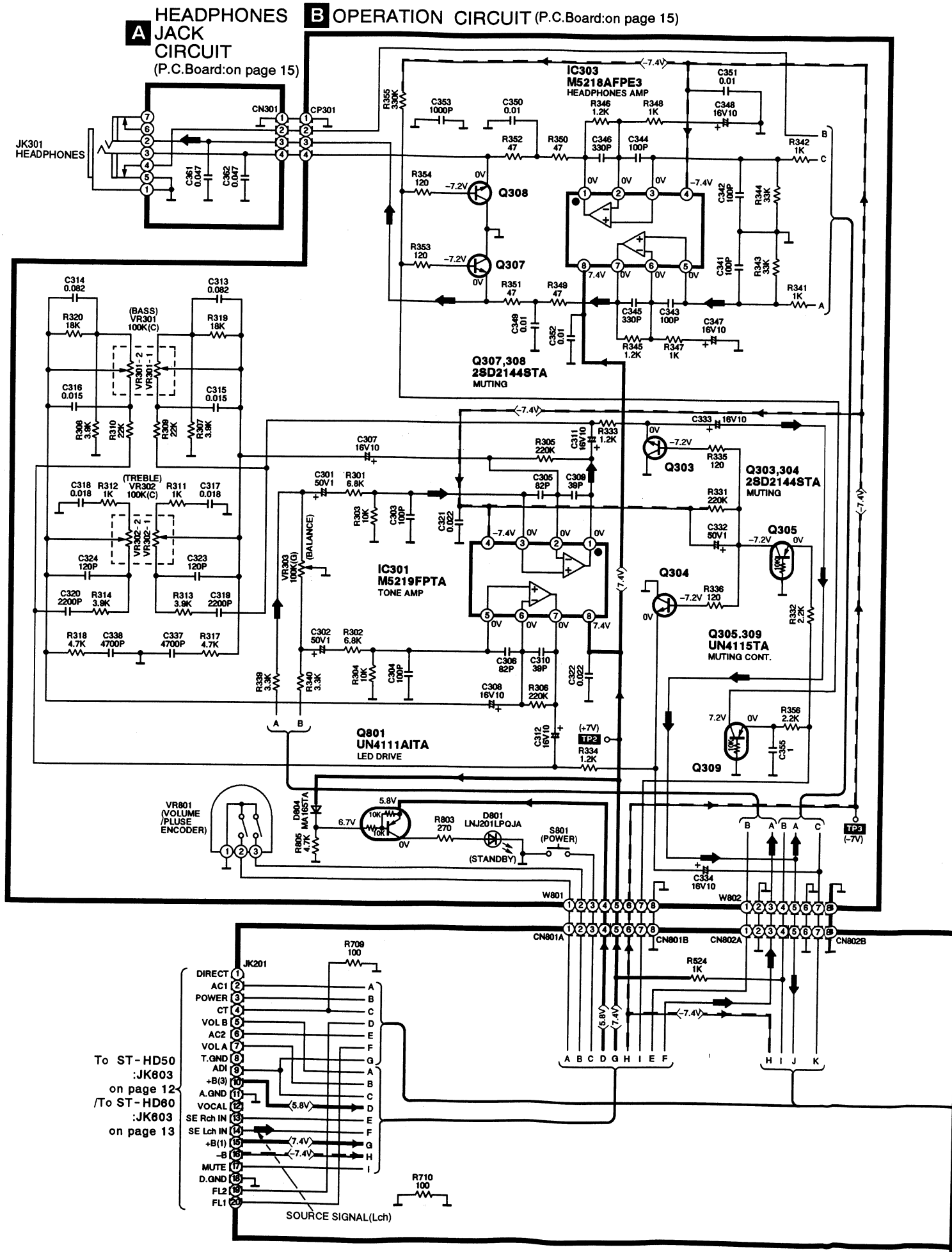
- **S801** : Power "STANDBY ⏻ /ON" switch (POWER, STANDBY ⏻ /ON)
- **VR301-1, VR301-2** : Bass control (BASS)
- **VR302-1, VR302-2** : Treble control (TREBLE)
- **VR303** : Balance control (BALANCE)
- **VR801** : Volume control (VOLUME)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  No mark: Power ON
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.
- **Voltage and signal line**

: Positive voltage line

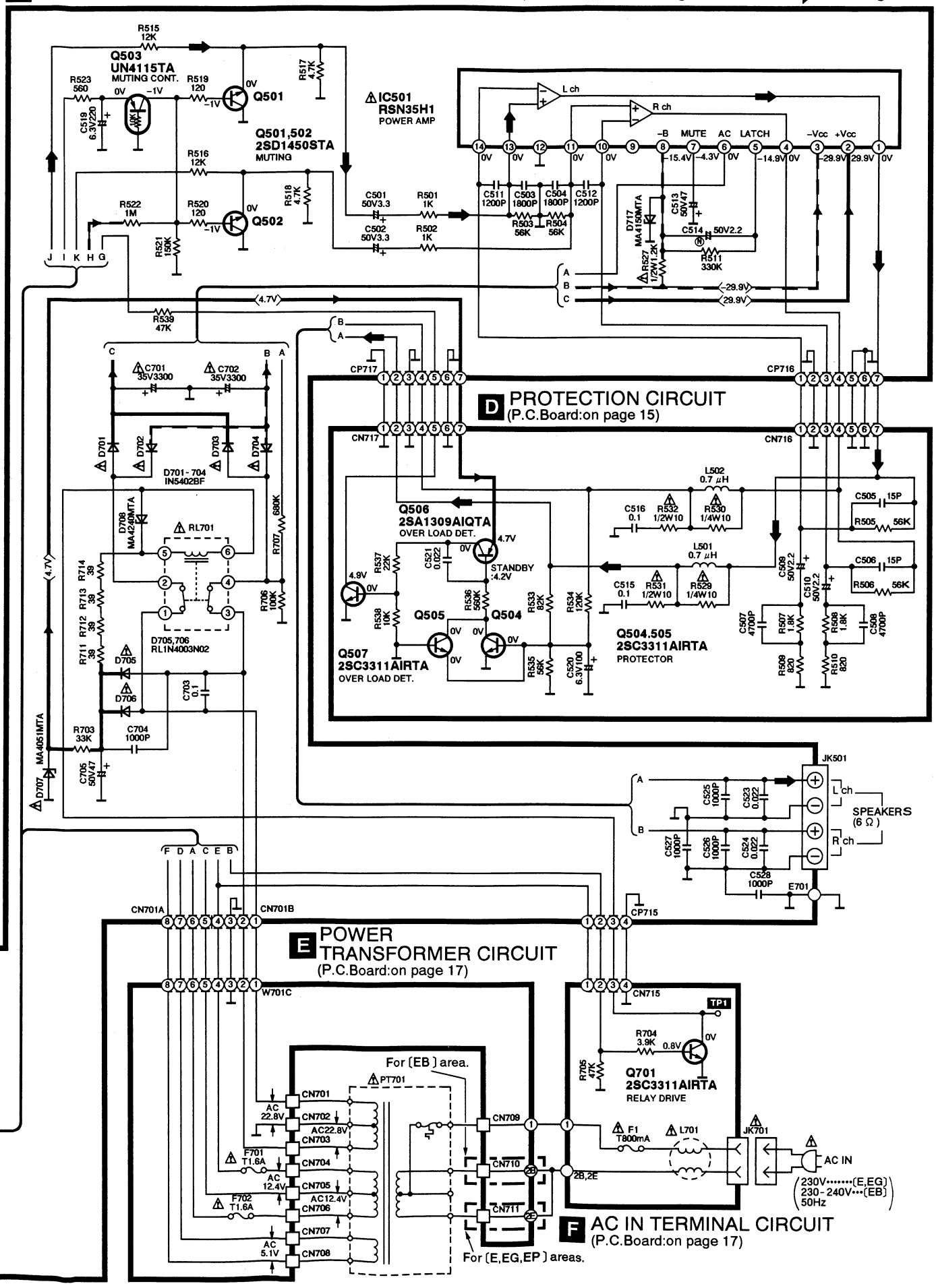
: Positive voltage line

: AM signal line


A HEADPHONES JACK CIRCUIT (P.C.Board:on page 15)
B OPERATION CIRCUIT (P.C.Board:on page 15)
JK301 HEADPHONES
CN301
CP301
IC303 M5218AFPE3 HEADPHONES AMP
Q308
Q307
Q307,308 2SD2144STA MUTING
IC301 M5219FPTA TONE AMP
Q303
Q303,304 2SD2144STA MUTING
Q305
Q304
Q305.309 UN4115TA MUTING CONT.
Q309
Q801 UN4111AITA LED DRIVE
VR801 (VOLUME /PLUSE ENCODER)
D801 LNJ201LPQJA
(STANDBY)
S801 (POWER)
W801
W802
CN801A
CN801B
CN802A
CN802B
JK201
To ST-HD50 :JK603 on page 12
/To ST-HD60 :JK603 on page 13
SOURCE SIGNAL(Lch)

C MAIN CIRCUIT (P.C.Board:on page 16)

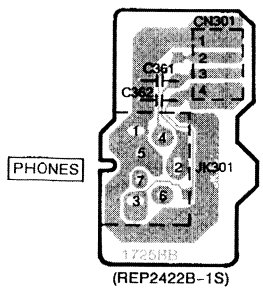
: Positive voltage line
: Positive voltage line
: AM signal line



■ Printed Circuit Board Diagram

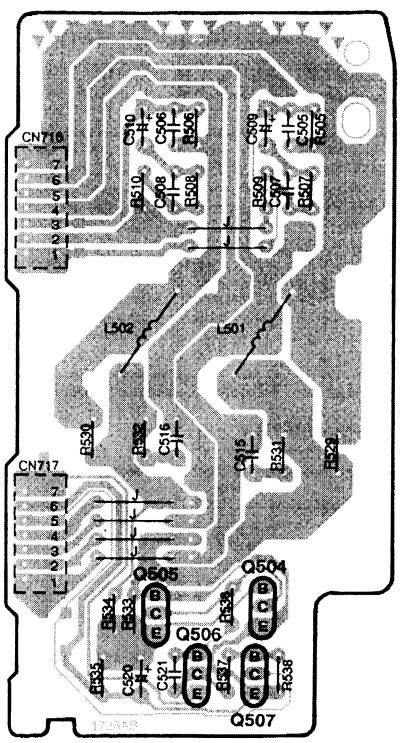
● This circuit board diagram may be modified at any time with the development of new technology.

A HEADPHONES JACK P.C.B.



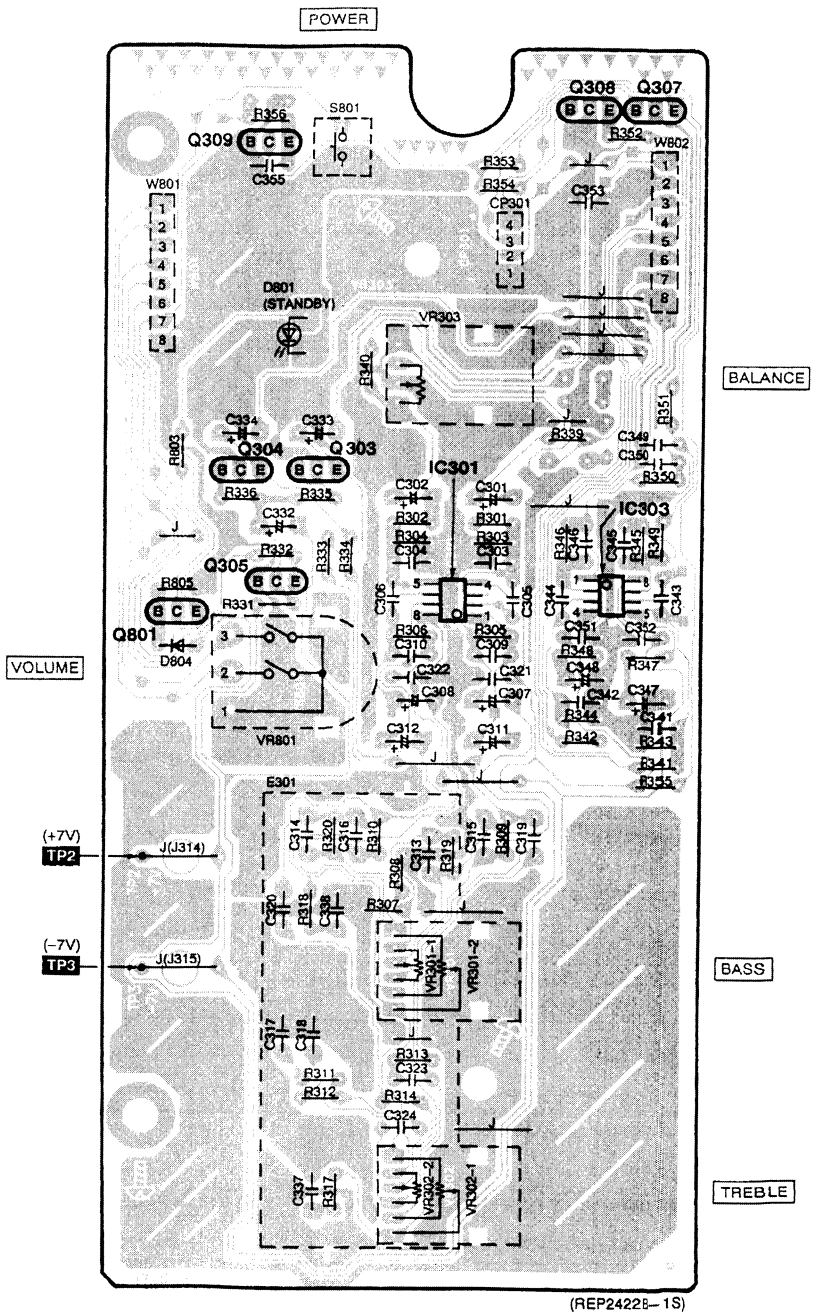
(REP2422B-1S)

D PROTECTION P.C.B.



(REP2423A-M)

B OPERATION P.C.B.

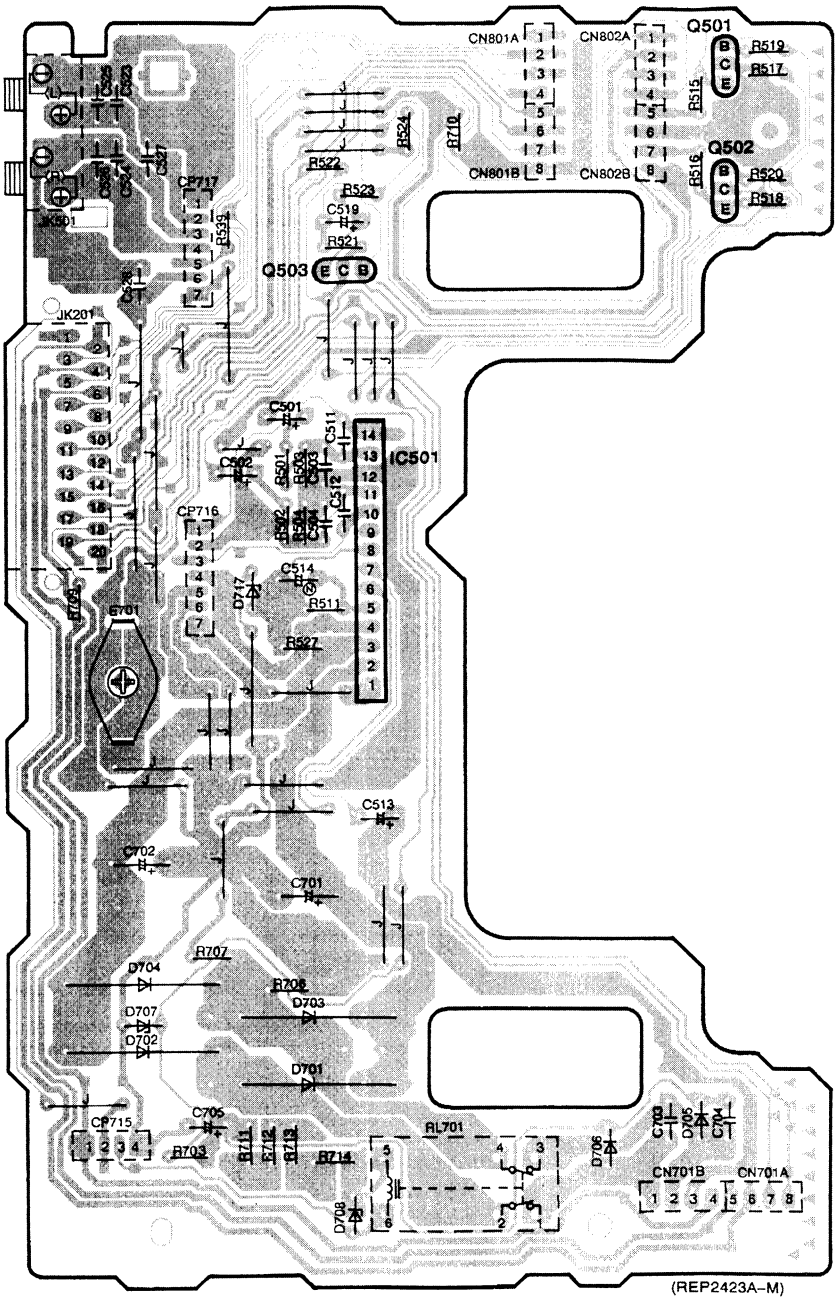


(REP2422B-1S)

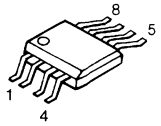
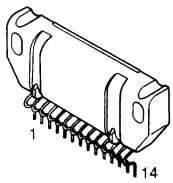
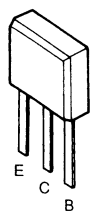
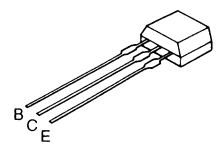
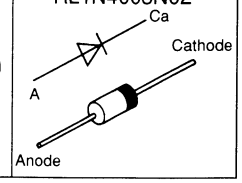
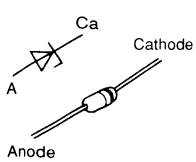
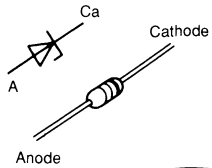
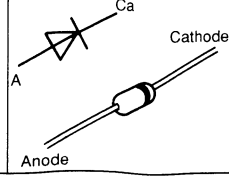
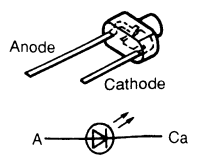
C MAIN P.C.B.

SPEAKERS (6 Ω)

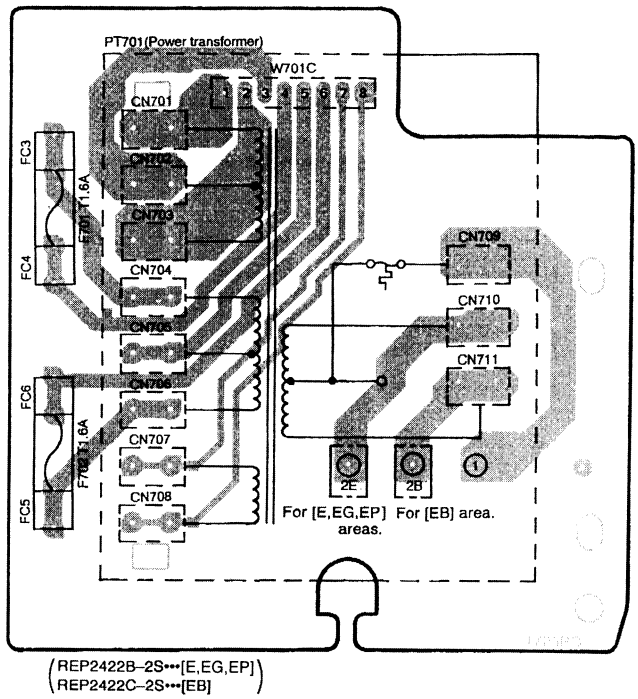
ST-HD50/ ST-HD60



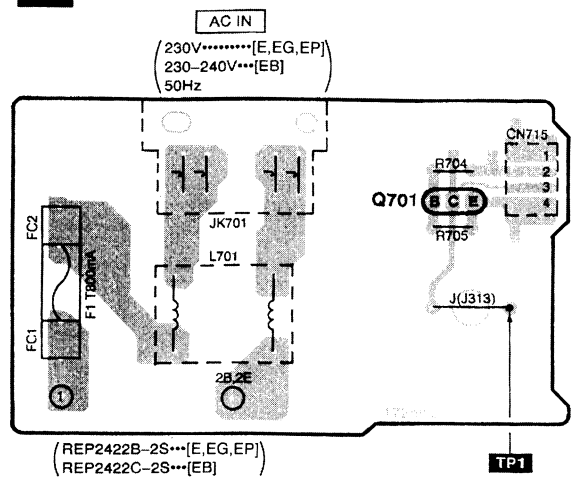
■ Type Illustration of ICs, Transistors and Diodes

M5218AFPE3 M5219FPTA 	RSN35H1 		2SA1309AIQTA 2SC3311AIRTA 2SD1450STA UN4111AITA UN4115TA	2SD2144STA 	1N5402BF RL1N4003N02 
MA4150MTA MA4240MTA 	MA4051MTA 	MA165TA 	LNJ201LPQJA 		

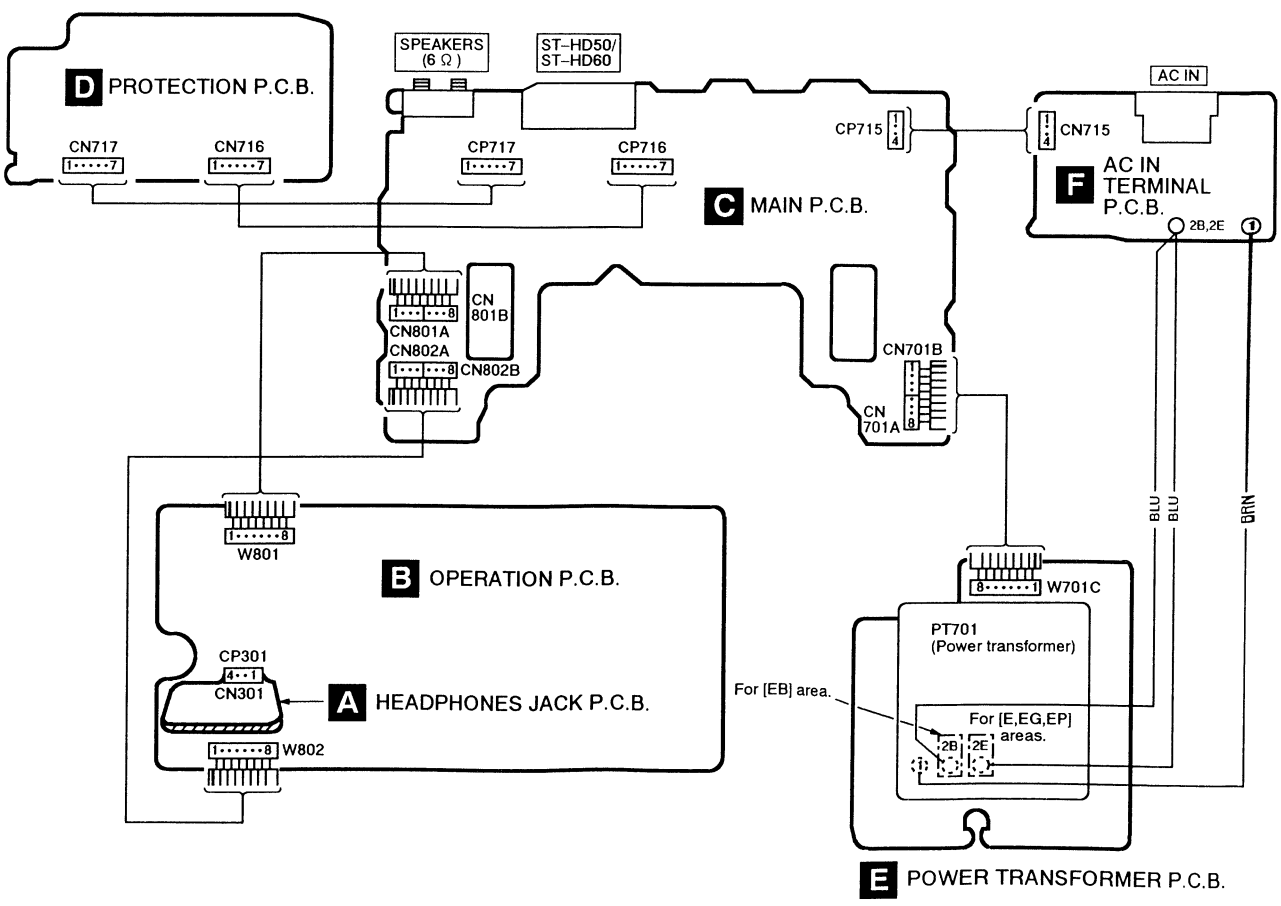
E POWER TRANSFORMER P.C.B.



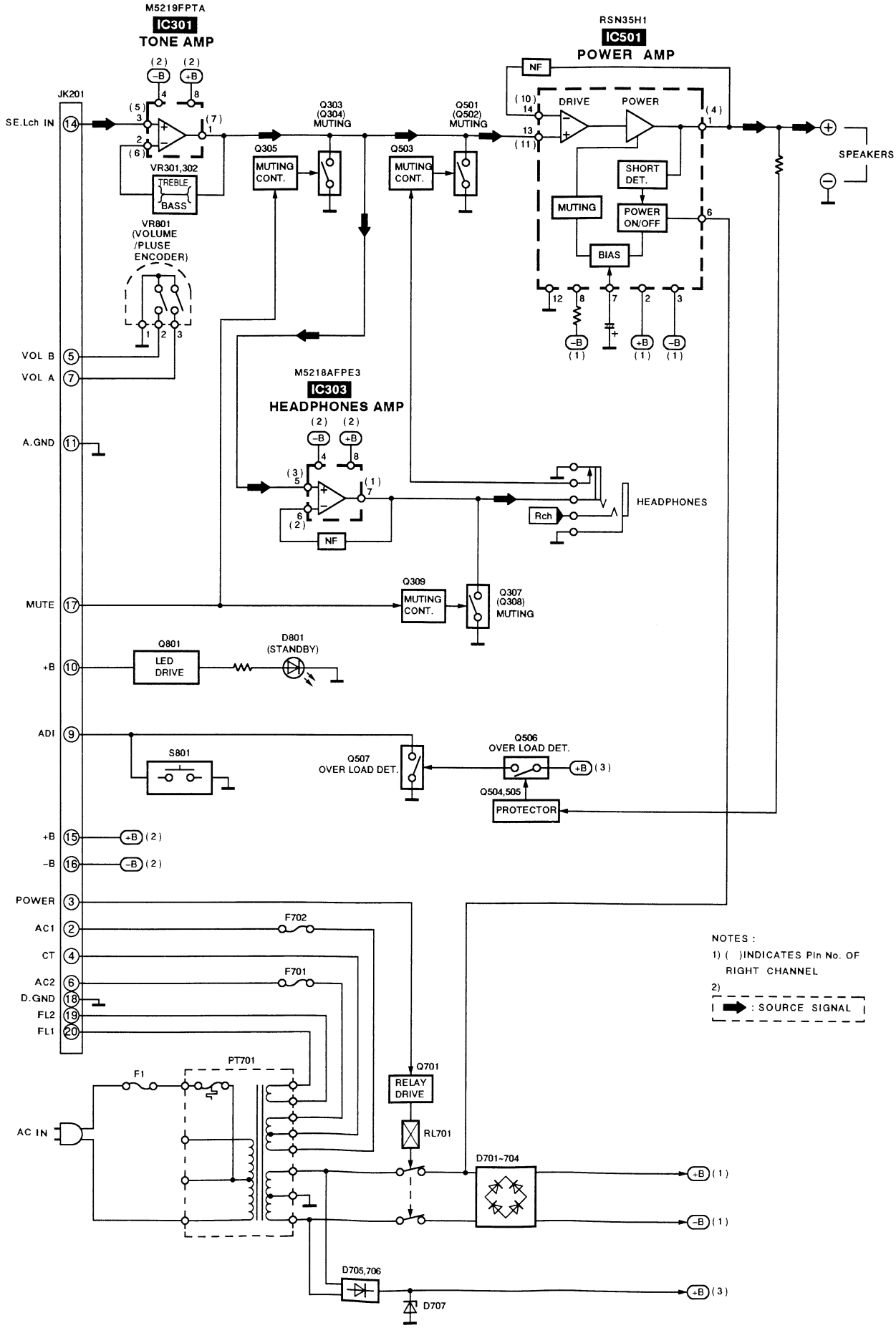
F AC IN TERMINAL P.C.B.



■ Wiring Connection Diagram



■ Block Diagram



■ Replacement Parts List (Electrical)

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC301	M5219FPTA	IC	[M]
IC303	M5218AFPE3	IC	[M]
IC501⚠	RSN35H1	IC	[M]
		TRANSISTOR(S)	
Q303, 304	2SD2144S	TRANSISTOR	[M]
Q305	UN4115	TRANSISTOR	[M]
Q307, 308	2SD2144S	TRANSISTOR	[M]
Q309	UN4115	TRANSISTOR	[M]
Q501, 502	2SD1450RTA	TRANSISTOR	[M]
Q503	UN4115	TRANSISTOR	[M]
Q504, 505	2SC3311AIRTA	TRANSISTOR	[M]
Q506	2SA1309AIQTA	TRANSISTOR	[M]
Q507	2SC3311AIRTA	TRANSISTOR	[M]
Q701	2SC3311AIRTA	TRANSISTOR	[M]
Q801	UN4111	TRANSISTOR	[M]
		DIODE(S)	
D701-704⚠	1N5402BF	DIODE	[M]
D705, 706⚠	RL1N4003N02	DIODE	[M]
D707⚠	MA4051MTA	DIODE	[M]
D708	MA4240H	DIODE	[M]
D717	MA4150M	DIODE	[M]
D801	LNJ201LPQJA	DIODE(LED)	[M]
D804	MA165	DIODE	[M]
		VARIABLE RESISTOR(S)	
VR301, 302	EVJYA1F04C15	V. R	[M]
VR303	EVJ02QF04G15	V. R	[M]
VR801	EVQWQAF2524B	V. R	[M]
		COIL(S)	
L501, 502	SLQY07G-40	COIL	[M]
L701⚠	RLQZ271M	COIL	[M]
		FUSE(S)	
F1⚠	XBA2C08TB0	FUSE	[M]
F701, 702⚠	XBA2C16TB0	FUSE	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
		SWITCH(ES)	
S801	EVQ21405R	SW	[M]
		CONNECTOR(S)	
CN301	RJU057W004	CONNECTOR(4P)	[M]
CN701-709	RJS1A1101T1	CONNECTOR(1P)	[M]
CN710	RJS1A1101T1	CONNECTOR(1P)	[M](EB)
CN711	RJS1A1101T1	CONNECTOR(1P)	[M](E, EG, EP)
CN715	RJU057W004	CONNECTOR(4P)	[M]
CN716, 717	RJU057W007	CONNECTOR(7P)	[M]
CN701A	RJS1A6604	CONNECTOR(4P)	[M]
CN801A	RJS1A6604	CONNECTOR(4P)	[M]
CN802A	RJS1A6604	CONNECTOR(4P)	[M]
CN701B	RJS1A6604	CONNECTOR(4P)	[M]
CN801B	RJS1A6604	CONNECTOR(4P)	[M]
CN802B	RJS1A6604	CONNECTOR(4P)	[M]
CP301	RJT057W004-1	CONNECTOR(4P)	[M]
CP715	RJT057W004-1	CONNECTOR(4P)	[M]
CP716, 717	RJT057W007-1	CONNECTOR(7P)	[M]
		EARTH TERMINAL(S)	
E301	RSC0340	EARTH TERMINAL	[M]
E701	SNE1004-2	EARTH TERMINAL	[M]
		FUSE HOLDER	
FC1-6	EYF52BC	FUSE HOLDER	[M]
		TRANSFORMER(S)	
PT701⚠	RTP2M5B012	POWER TRANSFORMER	[M]
		RELAY(S)	
RL701⚠	RSY0013M-0	RELAY	[M]
		JACK(S)	
JK201	RJT065K20	CONNECTOR(20P)	[M]
JK301	RJJ37TN01-C	HEADPHONES	[M]
JK501	RJR0054M	SPEAKERS	[M]
JK701⚠	SJS9236	AC INLET	[M]

■ Resistors and Capacitors

Notes: *Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)
*Resistance values are in ohms, unless specified otherwise, 1K = 1,000 (OHM) 1M = 1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R301, 302	ERDS2TJ682T	1/4W 6.8K [M]
R303, 304	ERDS2TJ103	1/4W 10K [M]
R305, 306	ERDS2TJ224T	1/4W 220K [M]
R307, 308	ERDS2TJ392T	1/4W 3.9K [M]
R309, 310	ERDS2TJ223	1/4W 22K [M]
R311, 312	ERDS2TJ102	1/4W 1K [M]
R313, 314	ERDS2TJ392T	1/4W 3.9K [M]
R317, 318	ERDS2TJ472	1/4W 4.7K [M]
R319, 320	ERDS2TJ183T	1/4W 18K [M]
R331	ERDS2TJ224T	1/4W 220K [M]
R332	ERDS2TJ222	1/4W 2.2K [M]
R333, 334	ERDS2TJ122	1/4W 1.2K [M]
R335, 336	ERDS2EJ121	1/4W 120 [M]
R339, 340	ERDS2TJ332	1/4W 3.3K [M]
R341, 342	ERDS2TJ102	1/4W 1K [M]
R343, 344	ERDS2TJ333	1/4W 33K [M]
R345, 346	ERDS2TJ122	1/4W 1.2K [M]
R347, 348	ERDS2TJ102	1/4W 1K [M]
R349-352	ERDS2TJ470	1/4W 47 [M]
R353, 354	ERDS2EJ121	1/4W 120 [M]
R355	ERDS2TJ334	1/4W 330K [M]
R356	ERDS2TJ222	1/4W 2.2K [M]
R501, 502	ERDS2TJ102	1/4W 1K [M]
R503-506	ERDS2TJ563	1/4W 56K [M]
R507, 508	ERDS2TJ182	1/4W 1.8K [M]
R509, 510	ERDS2TJ821	1/4W 820 [M]
R511	ERDS2TJ334	1/4W 330K [M]
R515, 516	ERDS2TJ123	1/4W 12K [M]
R517, 518	ERDS2TJ472	1/4W 4.7K [M]
R519, 520	ERDS2EJ121	1/4W 120 [M]
R521	ERDS2TJ154	1/4W 150K [M]
R522	ERDS2TJ105T	1/4W 1M [M]
R523	ERDS2TJ561	1/4W 560 [M]
R524	ERDS2TJ102	1/4W 1K [M]
R527⚠	ERDS1FJ122	1/2W 1.2K [M]
R529, 530⚠	ERD25FVJ100T	1/4W 10 [M]
R531, 532⚠	ERDS1FVJ100T	1/2W 10 [M]
R533	ERDS2TJ823T	1/4W 82K [M]
R534	ERDS2TJ124T	1/4W 120K [M]
R535	ERDS2TJ563	1/4W 56K [M]
R536	ERDS2TJ564	1/4W 560K [M]
R537	ERDS2TJ223	1/4W 22K [M]
R538	ERDS2TJ103	1/4W 10K [M]
R539	ERDS2TJ473	1/4W 47K [M]
R703	ERDS2TJ333	1/4W 33K [M]
R704	ERDS2TJ392T	1/4W 3.9K [M]
R705	ERDS2TJ473	1/4W 47K [M]
R706	ERDS2TJ104	1/4W 100K [M]
R707	ERDS2TJ684	1/4W 680K [M]
R709, 710	ERDS2TJ101	1/4W 100 [M]
R711-714	ERDS2TJ390	1/4W 39 [M]
R803	ERDS2TJ271	1/4W 270 [M]
R805	ERDS2TJ472	1/4W 4.7K [M]
		CAPACITORS
C301, 302	ECEA1HKA010B	50V 1U [M]
C303, 304	ECBT1H101KB5	50V 100P [M]
C305, 306	ECBT1H820KB5	50V 82P [M]
C307, 308	RCE1CKA100BG	16V 10U [M]
C309, 310	ECBT1H390J5	50V 39P [M]
C311, 312	RCE1CKA100BG	16V 10U [M]
C313, 314	ECQV1H823JM3	50V 0.082U [M]
C315, 316	ECQB1H153JF3	50V 0.015U [M]
C317, 318	ECQB1H183JF3	50V 0.018U [M]
C319, 320	ECQB1H222JF3	50V 2200P [M]
C321, 322	ECBT1E223ZF	25V 0.022U [M]
C323, 324	ECBT1H121KB5	50V 120P [M]
C332	ECEA1HKA010B	50V 1U [M]
C333, 334	RCE1CKA100BG	16V 10U [M]
C337, 338	ECQB1H472JF3	50V 4700P [M]
C341-344	ECBT1H101KB5	50V 100P [M]
C345, 346	ECBT1H331KB5	50V 330P [M]
C347, 348	RCE1CKA100BG	16V 10U [M]
C349-352	ECBT1E103ZF	25V 0.01U [M]
C353	ECBT1H102KB5	50V 1000P [M]
C355	ECBT1C105ZF5	16V 1U [M]
C361, 362	ECBT1H473ZF5	50V 0.047U [M]
C501, 502	RCE1HKA3R3BG	50V 3.3U [M]
C503, 504	ECBT1C182KR5	16V 1800P [M]
C505, 506	ECBT1H150J5	50V 15P [M]
C507, 508	ECBT1C472KR5	16V 4700P [M]
C509, 510	ECEA1HKA2R2B	50V 2.2U [M]
C511, 512	ECBT1C122KR5	16V 1200P [M]
C513	ECA1HM470B	50V 47U [M]
C514	ECEA1HKN2R2B	50V 2.2U [M]
C515, 516	ECQV1H104JM3	50V 0.1U [M]
C519	ECEA0JKA221B	6.3V 220U [M]
C520	ECEA0JKA101B	6.3V 100U [M]
C521	ECBT1E223ZF	25V 0.022U [M]
C523, 524	ECBT1E223ZF	25V 0.022U [M]
C525-528	ECBT1H102KB5	50V 1000P [M]
C701, 702⚠	ECA1VM332B	35V 3300U [M]
C703	ECQE1104KF3	100V 0.1U [M]
C704	ECKR2H102ZF5	500V 1000P [M]
C705	ECA1HM470B	50V 47U [M]

■ Replacement Parts List (Cabinet, Packing, Accessories and Jig/Tool)

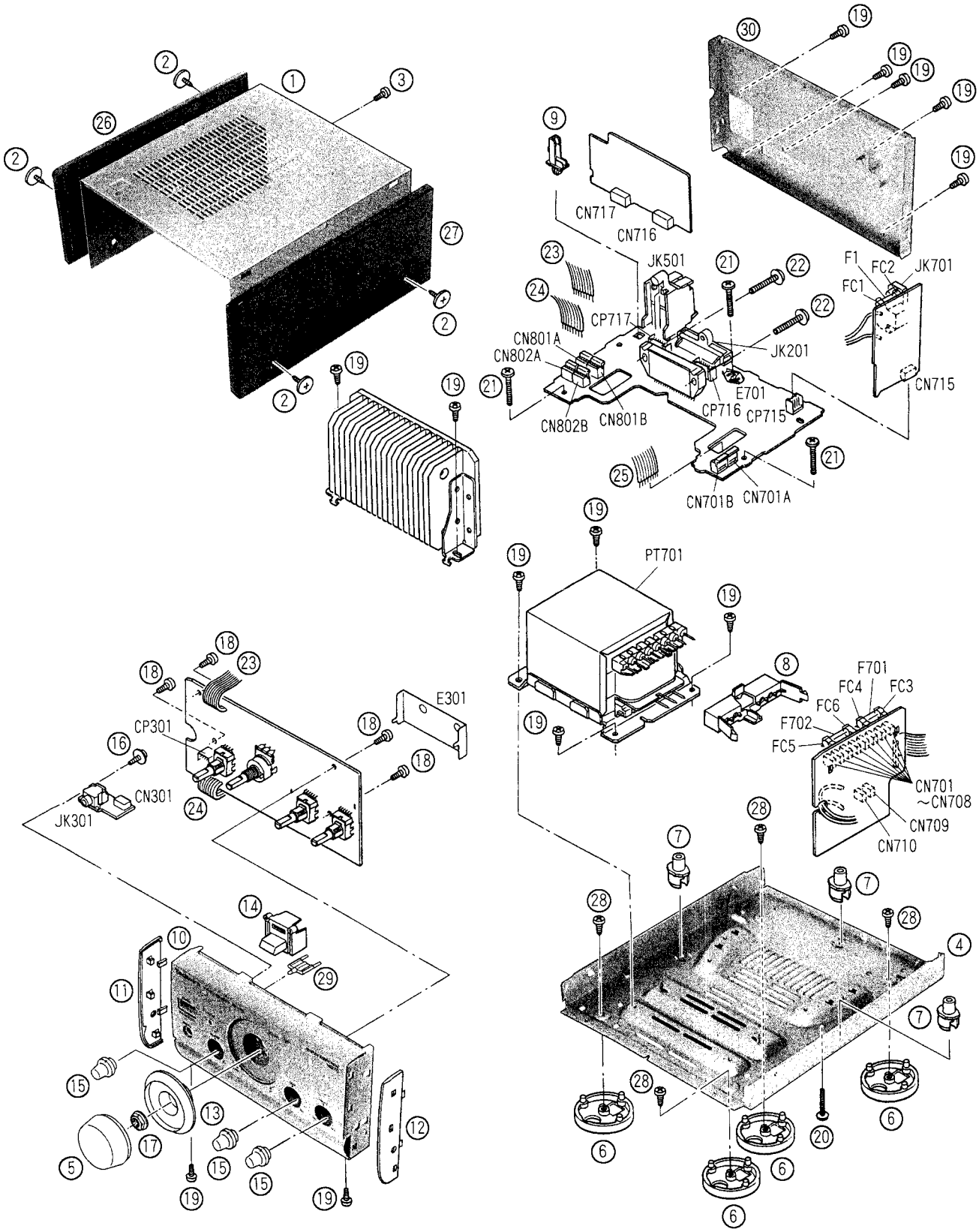
Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	RKM0326F-S	CABINET	[M]
2	RHD30073-K	SCREW	[M]
3	XTBS3+10JFZ1	SCREW	[M]
4	RMK0342-2	CHASSIS	[M]
5	RGW0247-S1	KNOB, VOLUME	[M]
6	RKA0076-N	FOOT	[M]
7	RKQ0089-2	P. C. B. SPACER	[M]
8	RMN0191	P. C. B. HOLDER	[M]
9	RMN0203	P. C. B. HOLDER	[M]
10	RFKGEHD50EN	FRONT PANEL ASS'Y	[M]
11	RGK0810-N	ORNAMENT	[M]
12	RGK0811-N	ORNAMENT	[M]
13	RGK0815-N	ORNAMENT	[M]
14	RGU1392-S	BUTTON, POWER	[M]
15	RGW0198-S	KNOB, TONE	[M]
16	RHD26016	SCREW	[M]
17	SNE4021-1	NUT	[M]
18	XTBS26+8J	SCREW	[M]
19	XTBS3+8JFZ1	SCREW	[M]
20	XTB3+12JFZ	SCREW	[M]
21	XTB3+20JFZ	SCREW	[M]
22	XTW3+15T	SCREW	[M]
23	RWJ1808190KX	FLAT CABLE(W801/8P)	[M]
24	RWJ1808160KX	FLAT CABLE(W802/8P)	[M]
25	RWJ1808090KX	FLAT CABLE(W701/8P)	[M]
26	RGK0808-M	ORNAMENT	[M]
27	RGK0809-M	ORNAMENT	[M]
28	XTB3+6G	SCREW	[M]
29	RGL0333-1Q	PANEL LIGHT	[M]
30	RGR0241A-L	REAR PANEL	[M] (E/EG/EP)
30	RGR0241A-M	REAR PANEL	[M] (EB)
		PACKING MATERIALS	
P1	RPG3403	GIFT BOX (AMPLIFIER)	[M] (E/EB/EG)
P1	RPG3528	GIFT BOX (AMP./DECK)	[M] (EP)
P1	RPG3405	GIFT BOX (TUNER)	[M] (E/EB)
P1	RPG3435	GIFT BOX (TUNER)	[M] (EG)
P1	RPG3529	GIFT BOX (TUNER/CD)	[M] (EP)
P1	RPG3404	GIFT BOX (CD)	[M] (E/EB/EG)
P1	RPG3174	GIFT BOX (DECK)	[M] (E/EB/EG)
P2	RPQ0731	PAD(ACCESSORY)	[M] (E/EB/EG)
P2	RPQ0771	PAD(ACCESSORY)	[M] (EP)
P3	RPN0970	PAD (AMPLIFIER)	[M]
P3	RPN0971	PAD (TUNER/CD)	[M]
P3	RPN1008	PAD (DECK)	[M] (E/EB/EG)
P3	RPN0970	PAD (DECK)	[M] (EP)
P4	SPP740	SHEET	[M]
P5	RPF0139	POLYETHYLENE COVER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
P6	RPG3530	GIFT BOX (SYSTEM)	[M] (EP)
		ACCESSORIES	
A1	RAK-CH215WH	REMOTE CONTROL TRANSMITTER	[M] (E, EB, EP)
A1	RAK-CH193WH	REMOTE CONTROL TRANSMITTER	[M] (EG)
A1-1	RKK0057-K	BATTERY COVER	[M]
A2	REE0393	SPEAKER CORD	[M]
A3	REX0608	FLAT CABLE (20P)	[M]
A4	REX0812	FLAT CABLE (19P)	[M]
A5	REX0813	SYSTEM CONNECTOR	[M]
A6⚠	RJA0019-2K	AC POWER SUPPLY CORD	[M] (E, EG, EP)
A6⚠	RJA0053-1X	AC POWER SUPPLY CORD	[M] (EB)
A7	RQA0117	WARRANTY CARD	[M]
A8	RQCB0169	SERVICENTER	[M]
A9	RQT3840-E	INSTRUCTION MANUAL	[M] (E)<IA>
A9	RQT3842-B	INSTRUCTION MANUAL	[M] (EB/EP)<IB>
A9	RQT3841-D	INSTRUCTION MANUAL	[M] (EG)<IC>
A9	RQT3862-H	INSTRUCTION MANUAL	[M] (EG)<ID>
A9	RQT4009-R	INSTRUCTION MANUAL	[M] (EP)<IE>
A10	RSA0007	FM INDOOR ANTENNA	[M]
A11	RSA0021	AM LOOP ANTENNA	[M]
A12	RQCA0527	QUICK SET UP GUIDE	[M] (EB)
A13	SJP9009	ANTENNA PLUG ADAPTER	[M] (EB)
		JIG/TOOL	
SA1	RFKX0002	GREASE	[M]

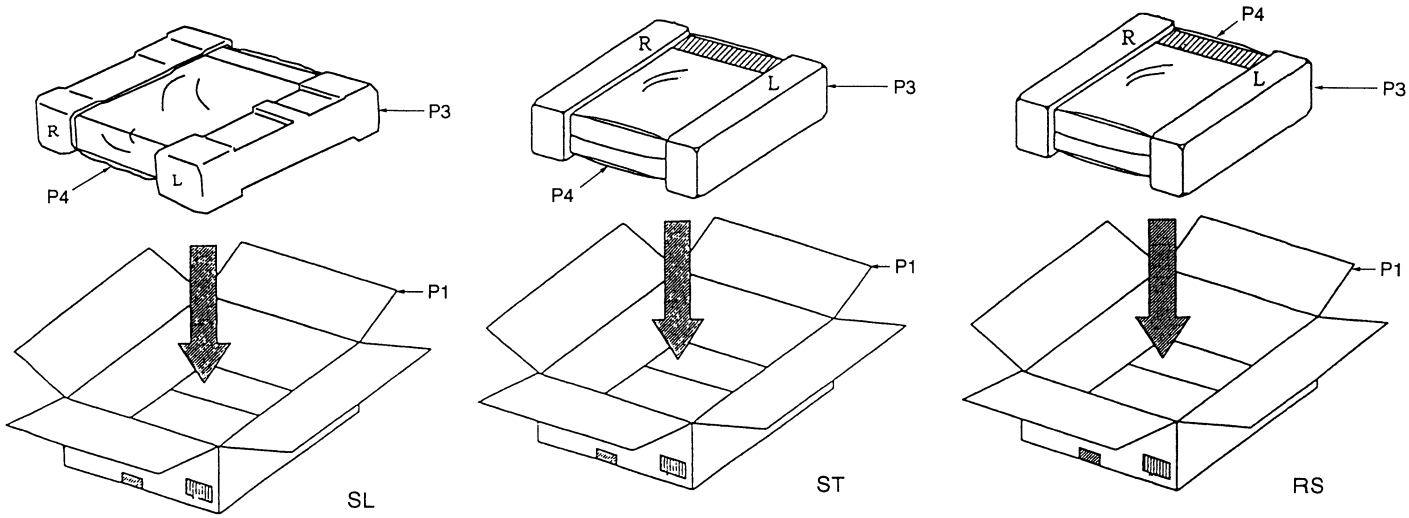
Note : The "< IA >, < IB >, < IC >, < ID >, < IE >" mark in Remarks indicate language of instruction manual.

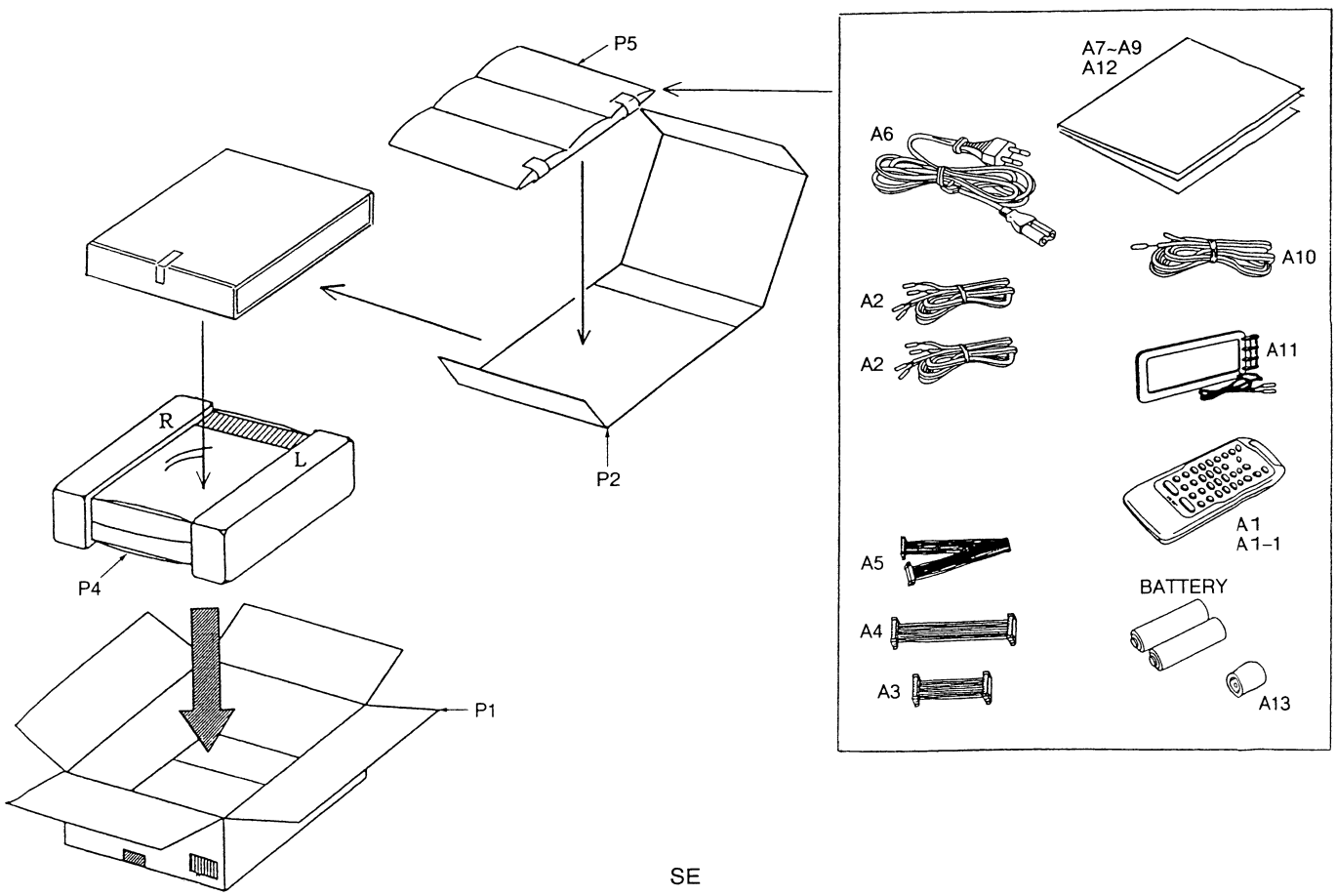
< IA > : French, Spanish, Swedish
< IB > : English
< IC > : German, Italian, French
< ID > : Dutch, Danish
< IE > : Russian, Polish, Czeco

■ Cabinet Parts Location

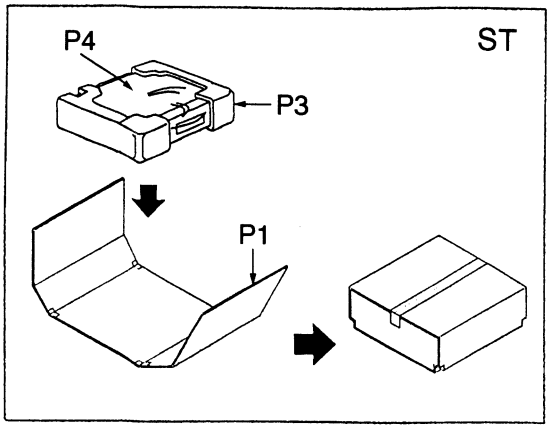


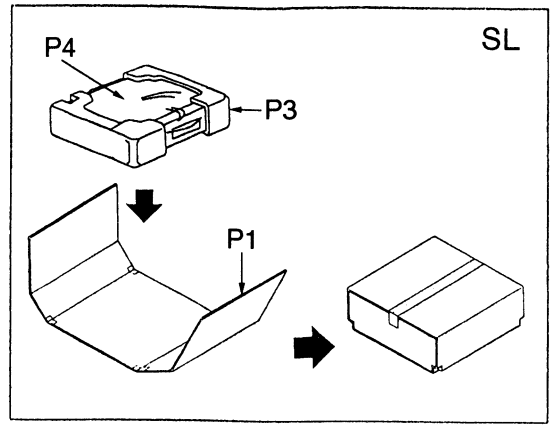
■ Packaging

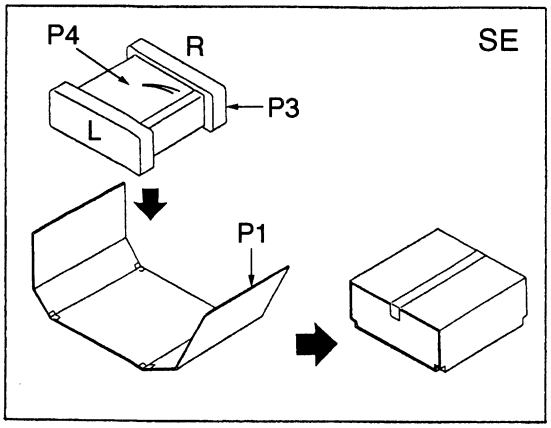


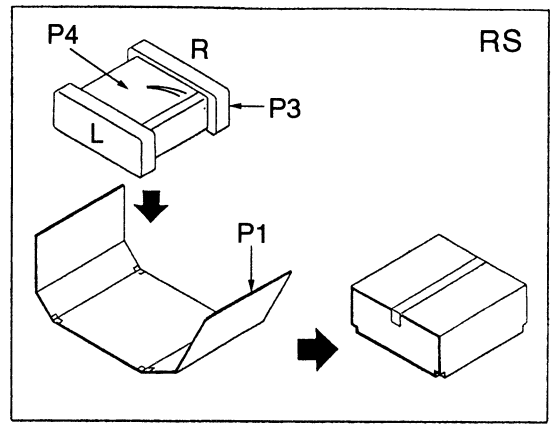


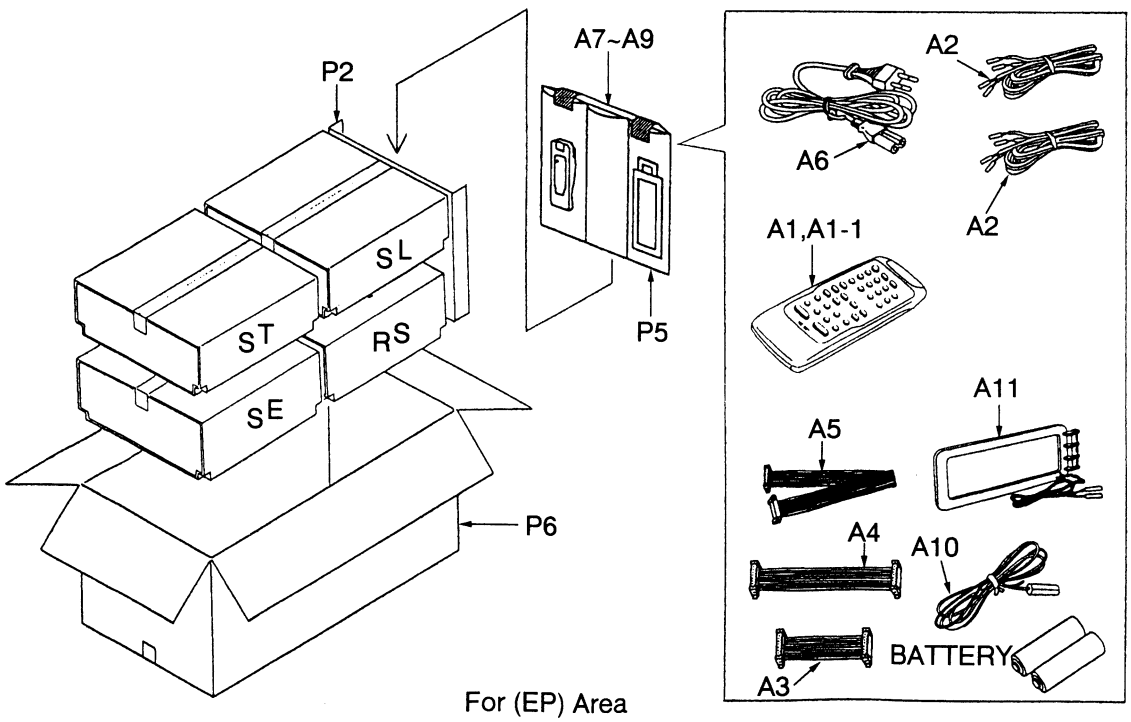
For (E), (EB), (EG) Area











For (EP) Area

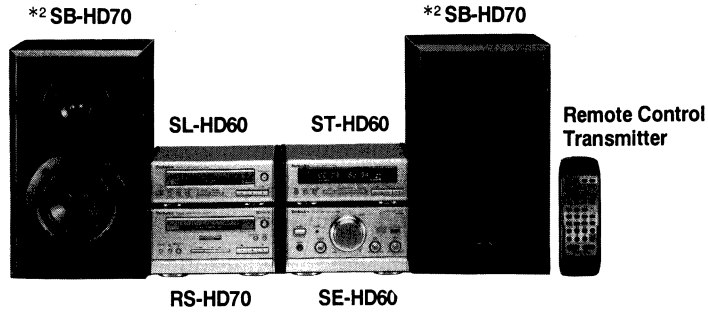
Printed in Japan
F970207500KH/HY

ORDER NO. AD9702020C2

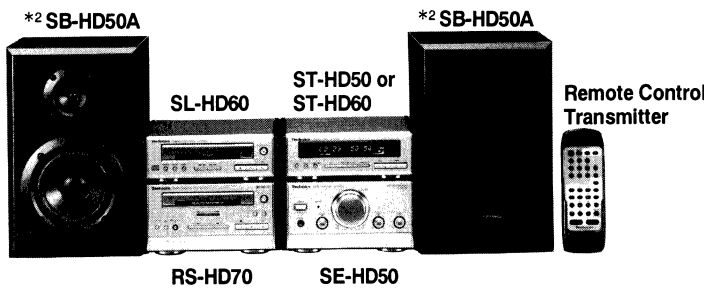
Service Manual

CD Player

System: SC-HD60



System: SC-HD50



CD Player

SL-HD60

Colour

(N) ..... Gold

Areas

(E)/(EP) ..... Europe, Russia.

COMPACT disc DIGITAL AUDIO

MASH*1 multi-stage noise shaping

Because of unique interconnecting cables, when a compact requires service, send or bring in the entire system.

*2

System	Areas	Tuner
SC-HD50	(Germany. Italy.)	: ST-HD60
SC-HD50	(Europe. Russia.)	: ST-HD50

Specifications

Audio

DA converter: 1 bit 2 DAC MASH *1

Pickup

Wavelength: 780 nm

General

Dimensions: 196(W)/67(H)/228(D) mm
Weight: 1.3 kg

Notes:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

*1 MASH is a trademark of NTT

System/SC-HD60:
Tuner: ST-HD60, **Compact Disc Player: SL-HD60**, Amplifier: SE-HD60, Cassette Deck: RS-HD70, Speakers: SB-HD70

System/SC-HD50:
Tuner: ST-HD50 or ST-HD60, **Compact Disc Player: SL-HD60**, Amplifier: SE-HD50, Cassette Deck: RS-HD70, Speakers: SB-HD50A

Notes: *2 ..... Made in PAES

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

© 1997 Matsushita Electric Industrial Co., Ltd. All rights reserved. Unauthorized copying and distribution is a violation of law.

■ Contents

	Page
Handling Precautions for Traverse Deck	2
Precaution of Laser Diode	3
Location of Controls	3
Listening to Compact Disc	4
Operation Checks and Main Component Replacement Procedures	5 ~ 12
Schematic Diagram	13 ~ 17
Type Illustration of IC's, Transistors and Diodes	18
Wiring Connection Diagram	18
Printed Circuit Board Diagram	19, 20
Terminal Function of IC's	21 ~ 23
Error Code Display and Servo Adjustment Function	24, 25
To Supply Power Source	26
Block Diagram	27, 28
Troubleshooting Guide	29, 30
Replacement Parts List (Electrical)	31
Resistors and Capacitors	32, 33
Cabinet Parts Location	34
Loading Mechanism Parts Location	35
Replacement Parts List (Cabinet, Loading Mechanism and Jig/Tool)	36

NOTE:
Refer to the service manual for Model No. SE-HD60 (ORDER No. AD9701022C2) and Model No. SE-HD50 (ORDER No. AD9701017C2) for information on "Accessories", "Installation", "Connections" and "Packaging".

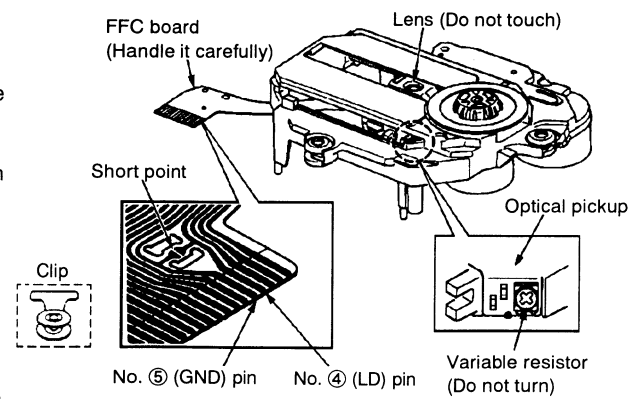
CAUTION:
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

■ Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body. So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

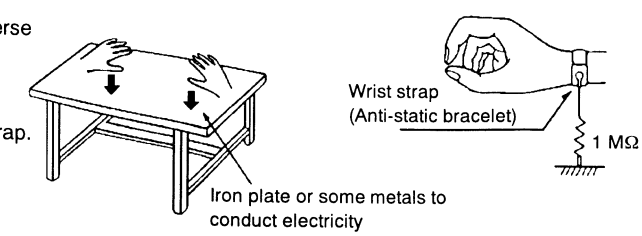
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To protect the laser diode against electrostatic breakdown, short the flexible board (FFC board) with a clip or similar object.
3. Take care not to apply excessive stress to the flexible board (FFC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.



● Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conducive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



Caution when Replacing the Traverse Deck:

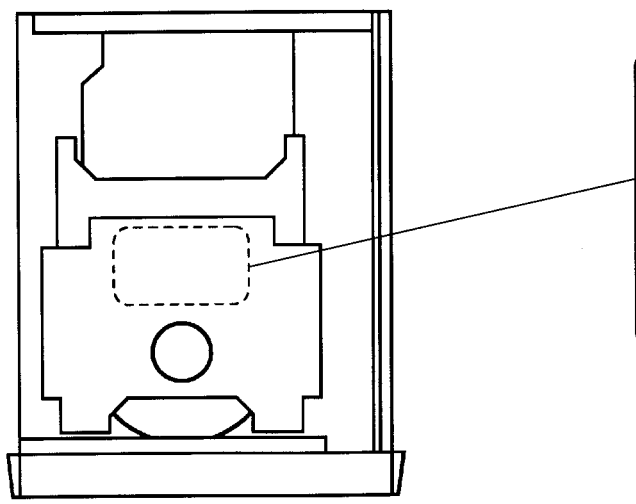
The traverse deck has a short point shorted with solder to protect the laser diode against electrostatic breakdown. Be sure to remove the solder from the short point before making connections.

■ Precaution of Laser Diode

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780 nm
Maximum output radiation power from pick up: 100 μW/VDE

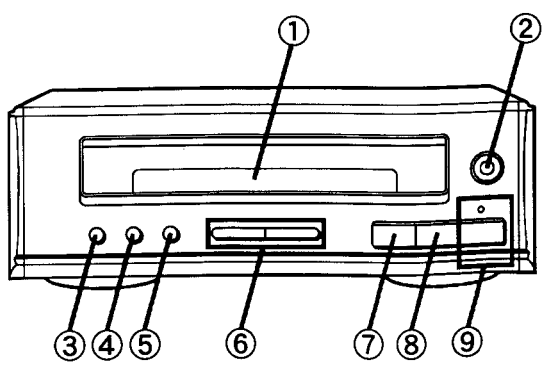
Laser radiation from the pick up unit is safety level, but be sure the followings:

1. Do not disassemble the pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not lock at the focus lens using optical instruments.
4. Recommend not to lock at pick up lens for a long time.



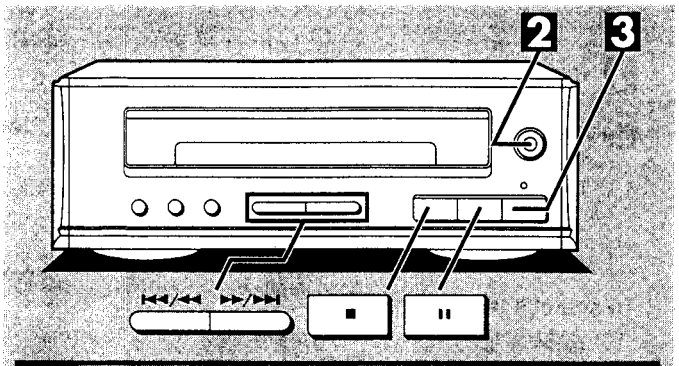
DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVERSEL	USYNLIG LASERSTRÅLING VED ÅBNING SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄRURKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

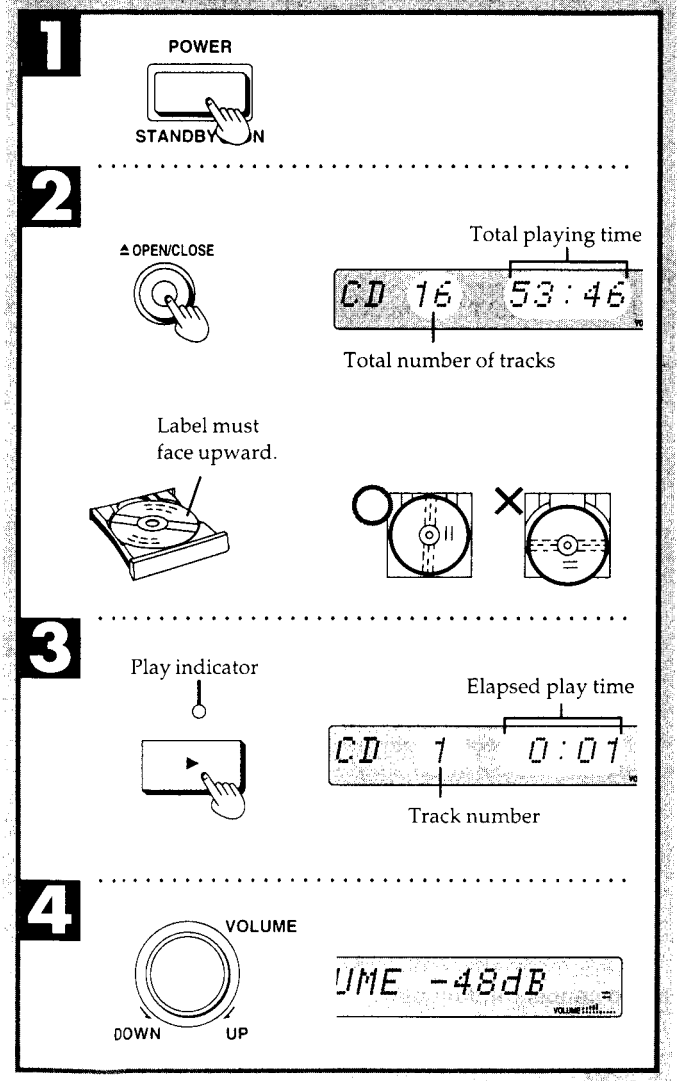
■ Location of Controls

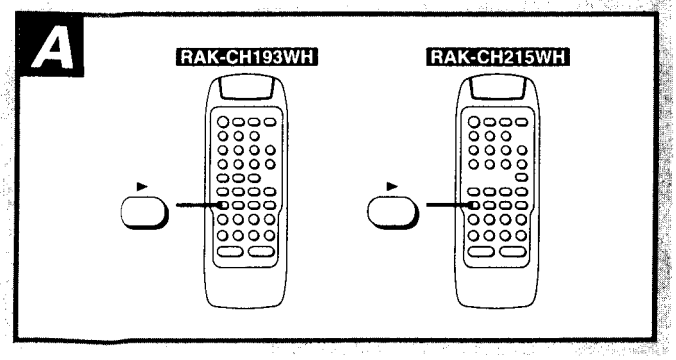


① Disc tray
② Disc tray open/close button (⏏ OPEN/CLOSE)
③ Random play button (RANDOM)
④ Repeat button (REPEAT)
⑤ AI edit button (AI EDIT)
⑥ Skip/search buttons (⏮/◀◀, ▶▶/⏭)
⑦ Stop button (■)
⑧ Pause button (❚❚)
⑨ Play button and indicator (▶)

■ Listening to Compact Disc







Sequential play

1 Switch on the power.

2 Press ≜ OPEN/CLOSE to open the tray. Set a CD on the tray.

Press ≜ OPEN/CLOSE once again to close the tray.

When the "CD" input source is selected, total number of tracks and total playing time will appear on the display.

Note

The total playing time displayed when a disc is loaded includes intervals between tracks. This is why sometimes the displayed time is longer than that listed on the CD.

3 Press ►.

Play will start from the first track, and will stop automatically when the last track is finished.

4 Adjust the volume level as you like.

To stop the disc play:

Press ■.

To temporarily stop the disc play:

Press II. The play indicator flashes up green.
To play again, press ►.

When "CD NO DISC" display appears:

It indicates that a CD has not been inserted in the tray.

About play indicator:

While stopped: Lights up orange.
While playing: Lights up green.

For your reference:

If you press ► instead of ≜ OPEN/CLOSE after setting a CD, the tray will close and play will start directly from the track 1.

To search forward/backward:

Available only from the main unit

Hold down I◄◄/◄◄ or ►►/►►I during playback.
►►/►►I: To search forward
I◄◄/◄◄: To search backward

To skip forward/backward:

Press I◄◄/◄◄ or ►►/►►I.
►►/►►I: To skip forward
I◄◄/◄◄: To skip backward

Note

During random play, you can not skip to tracks which have already been played out. (page 18)

For your reference:

- During program play or random play, you can search-forward/backward only within the current track. (pages 18 and 19)
- During program play, skipping is always in the programmed order, whether forward or backward. (page 19)

One-touch play A

When the system is OFF, playing starts automatically when you press ► on the remote control.
The play will start with volume increasing gradually.

Note

Do not use CDs with poorly attached labels or stickers.
Adhesive protruding from underneath stickers or left over from peeled off stickers can cause your system to malfunction.

■ Operation Checks and Main Component Replacement Procedures

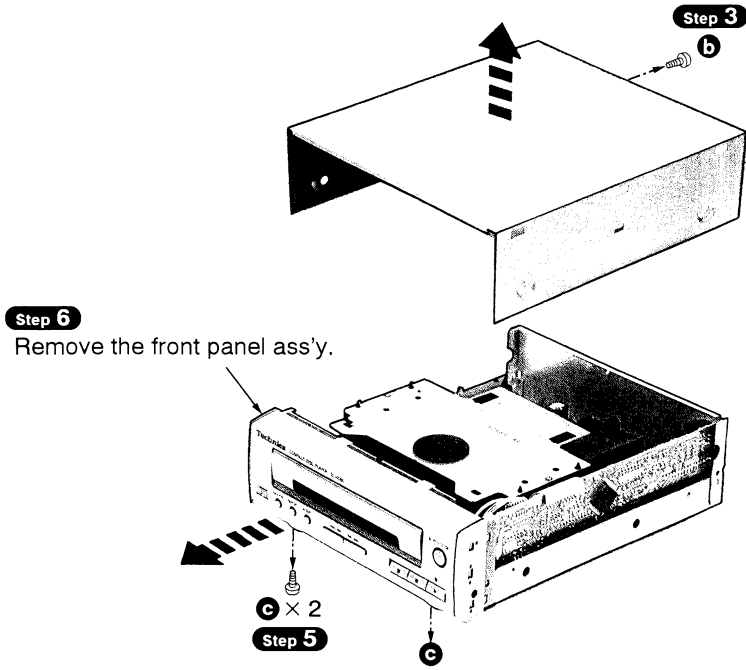
NOTE

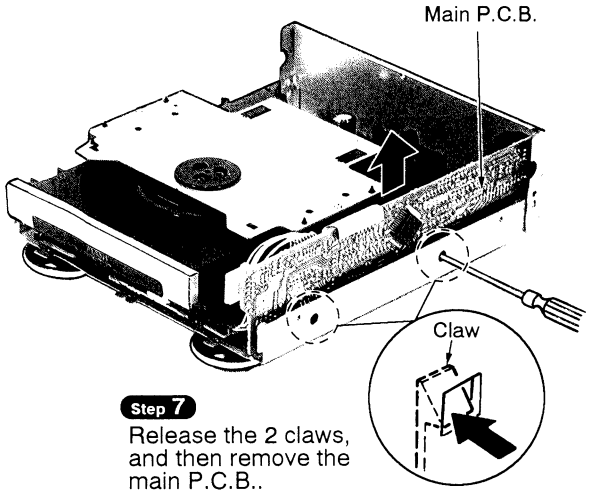
1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.**

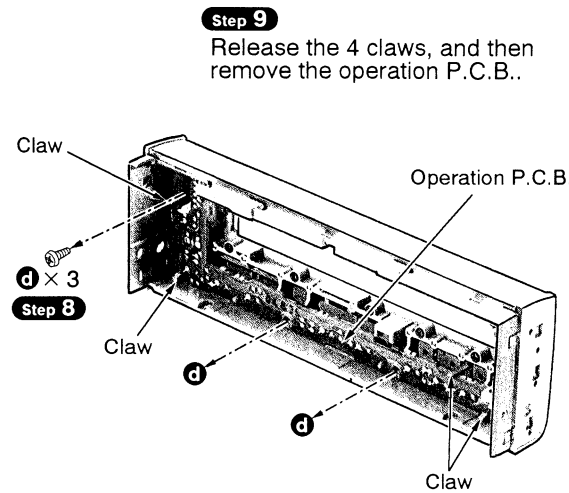
• Contents

• Checking Procedure for each P.C.B. Page.

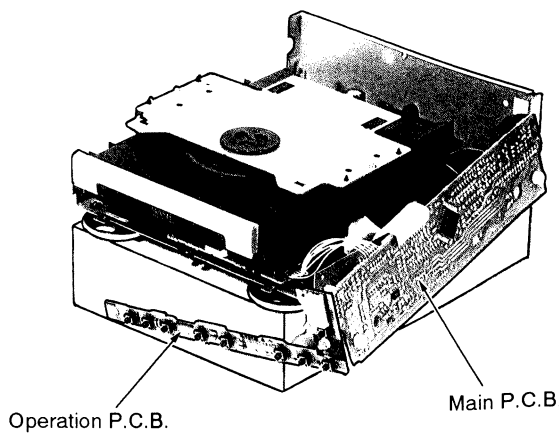
1.Checking for the main P.C.B.. • • •





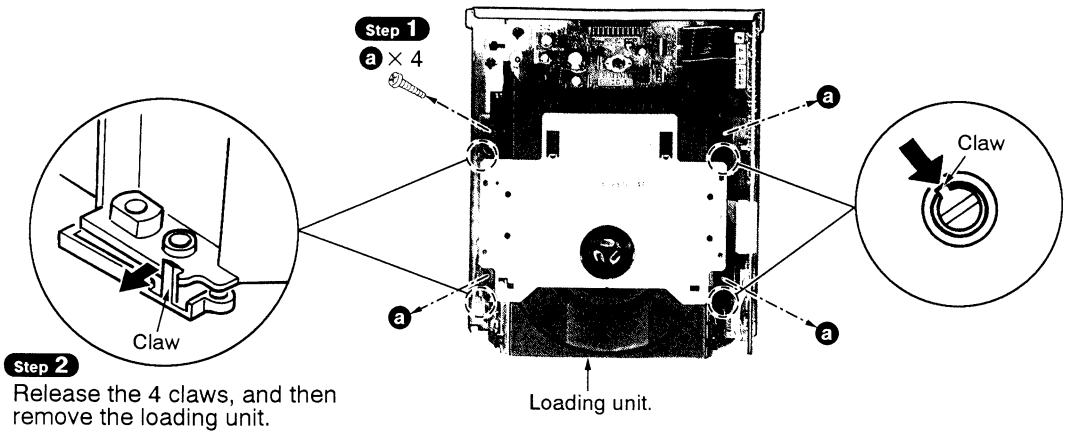


• Check the main P.C.B. as shown below.

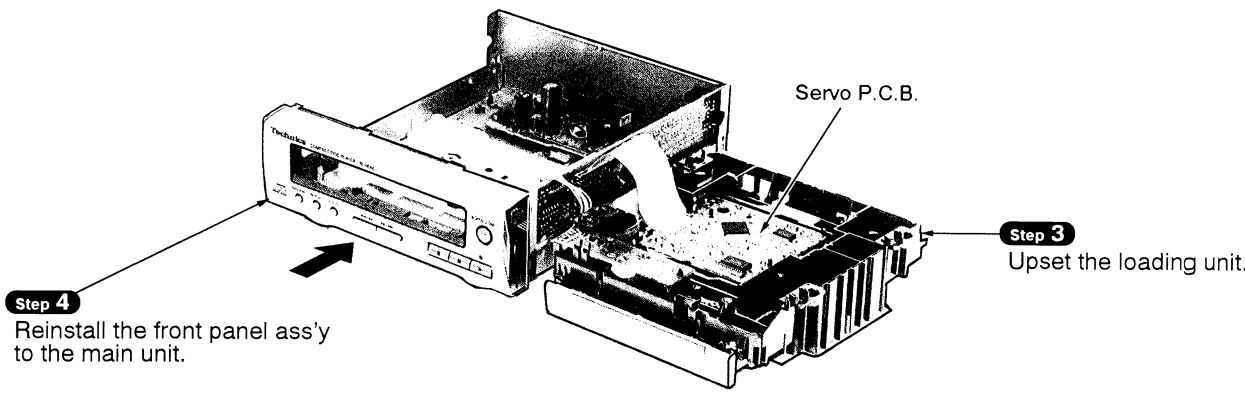


2. Checking for the servo P.C.B.

• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.



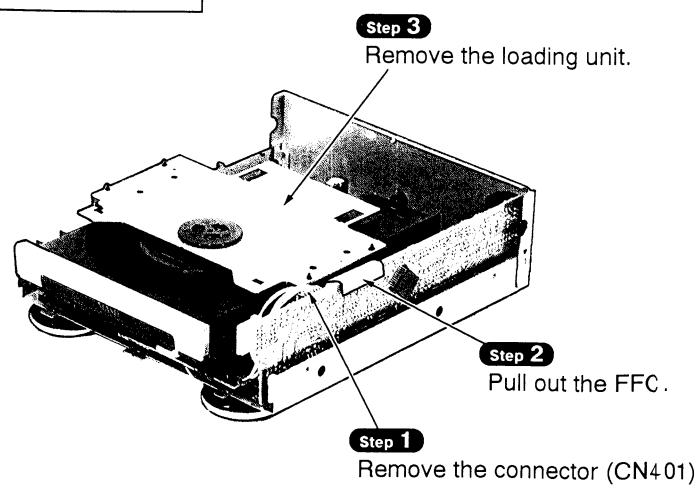
• Check the servo P.C.B. as shown below.

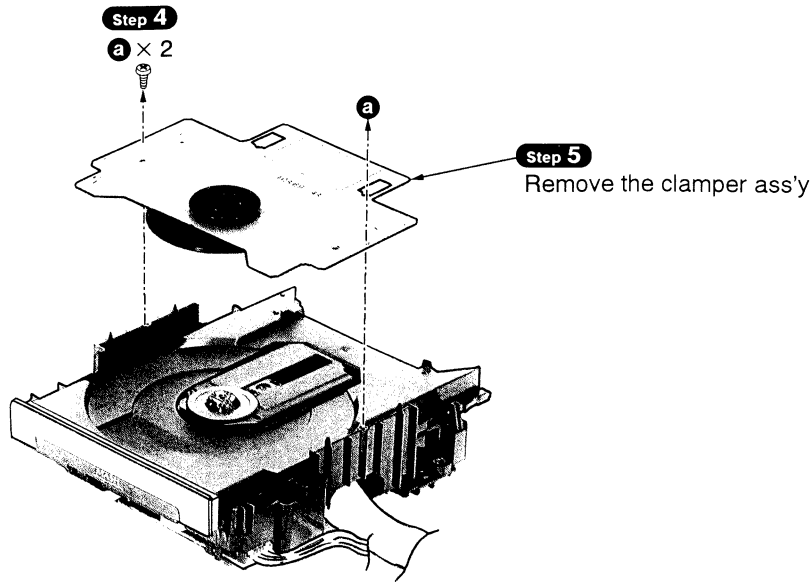


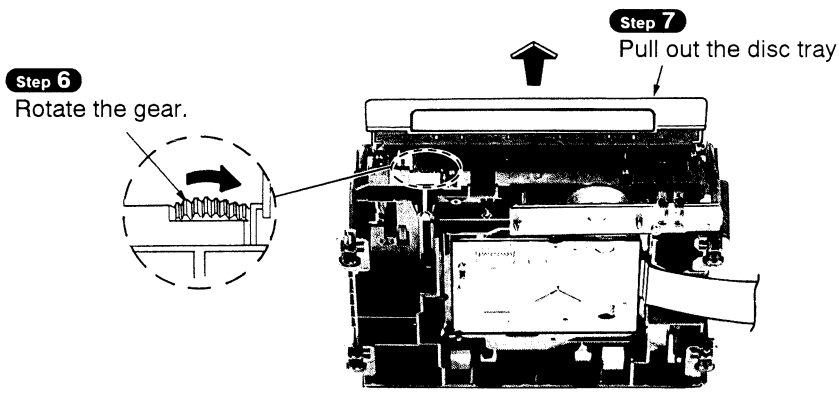
■ Main Component Replacement Procedures

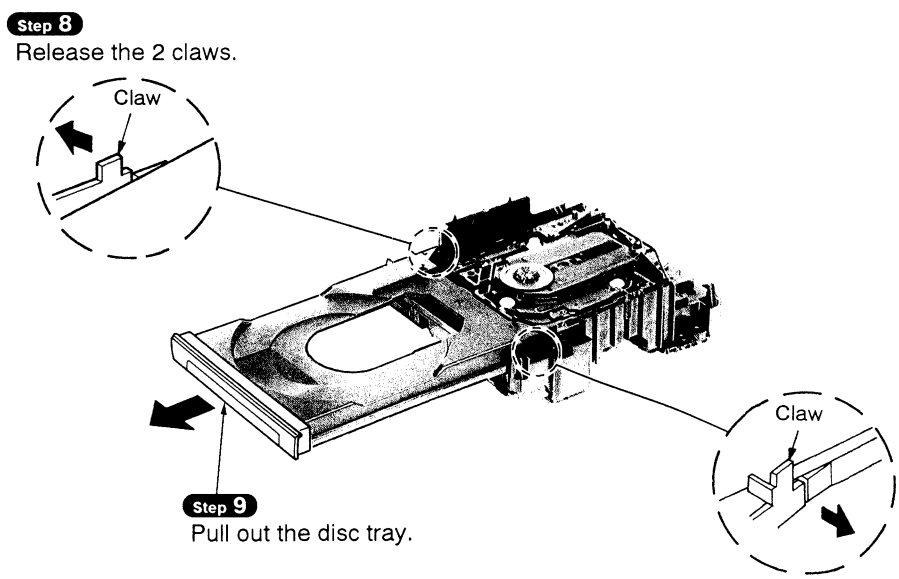
1. Replacement for the traverse deck ass'y

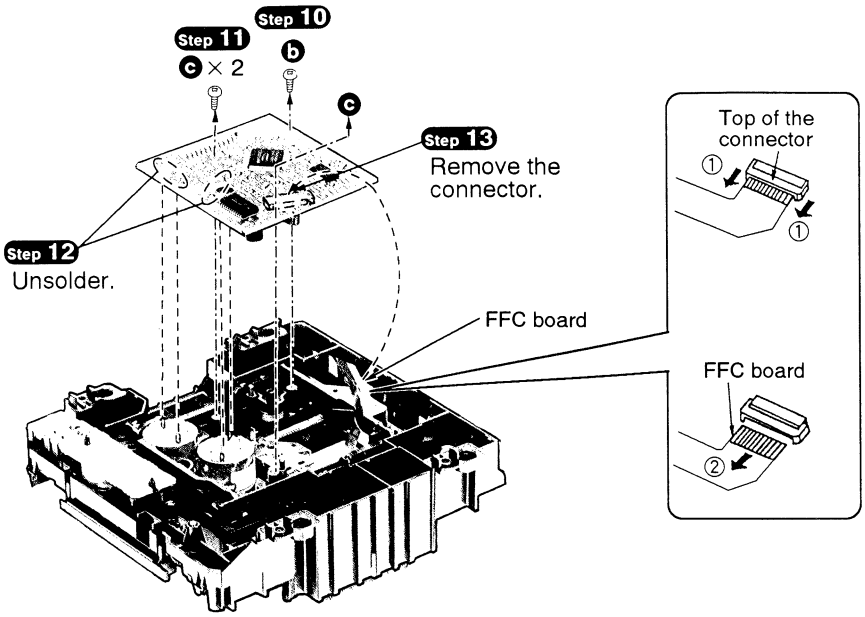
• Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.
• Follow the Step 1 , Step 2 of the item 2 in checking procedure for each P.C.B. on page 7.



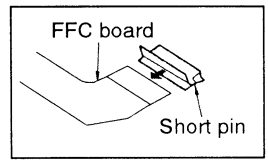

Step 4
ⓐ × 2
ⓐ
Step 5
Remove the clamper ass'y.


Step 7
Pull out the disc tray.
Step 6
Rotate the gear.


Step 8
Release the 2 claws.
Claw
Claw
Step 9
Pull out the disc tray.

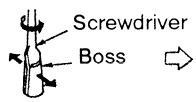


Caution:
Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck" on page 2.)

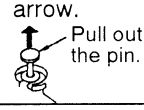


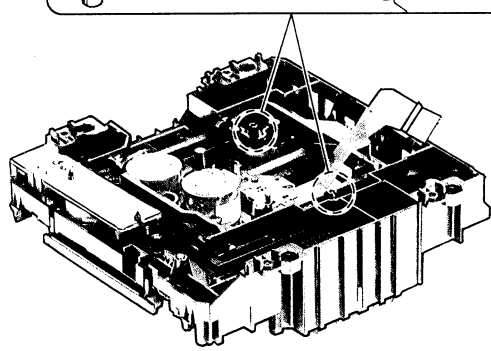
Step 14

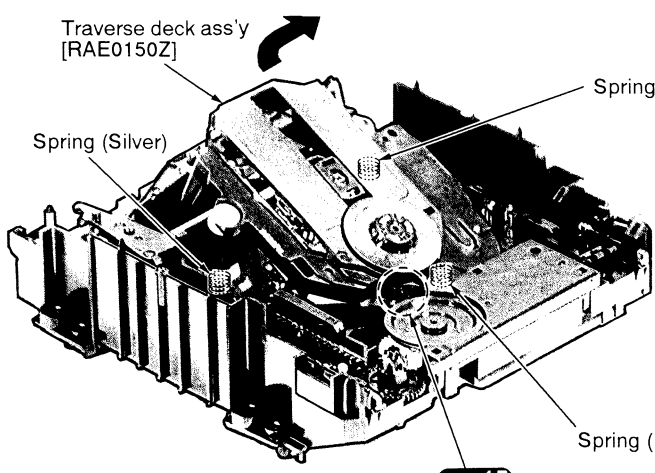
1. Widen the boss using a regular screwdriver.



2. Pull out the pin in the direction of the arrow.



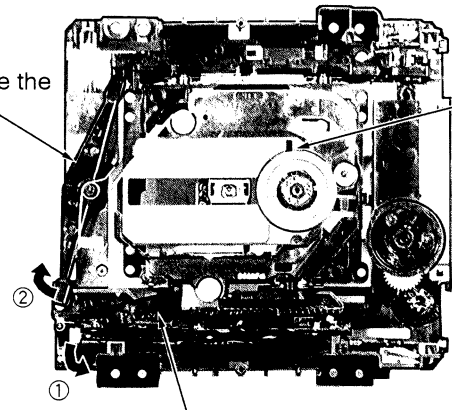




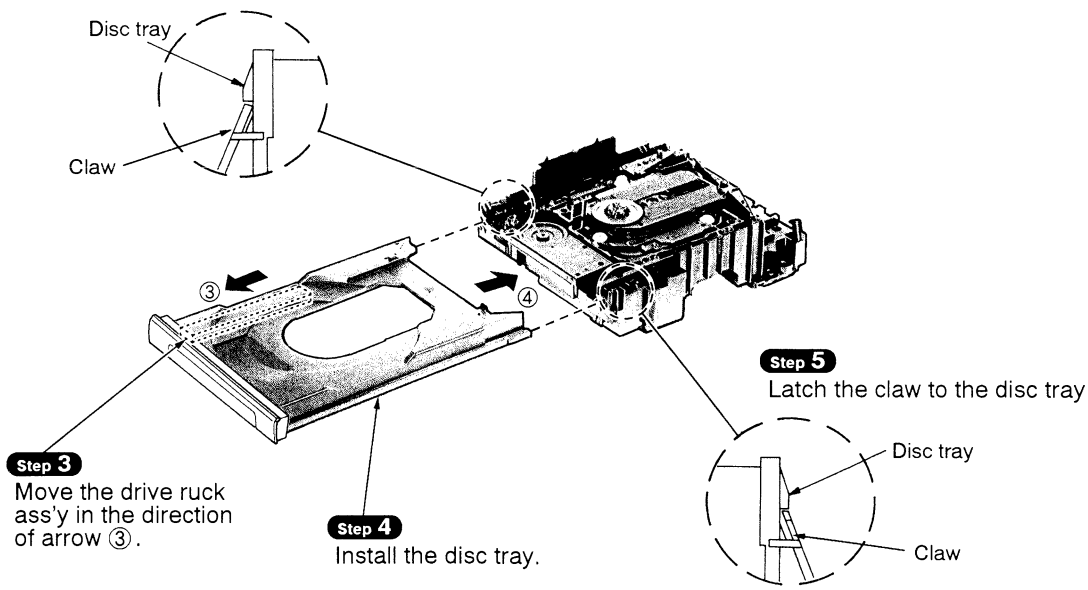
NOTE
Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

Installation of the disc tray after replacement

Step 2
Operate the lever, and then locate the traverse deck to "UP" position.



Step 1
Release the lock lever.

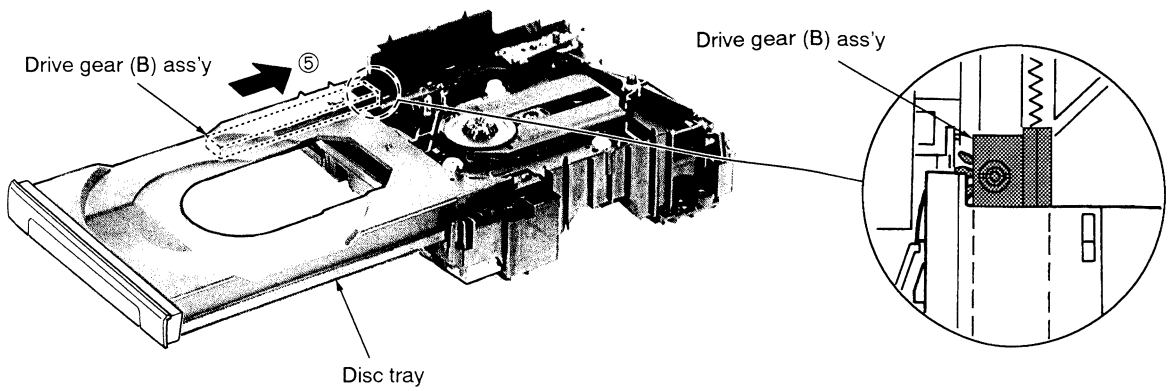


Step 3
Move the drive ruck ass'y in the direction of arrow ③.

Step 4
Install the disc tray.

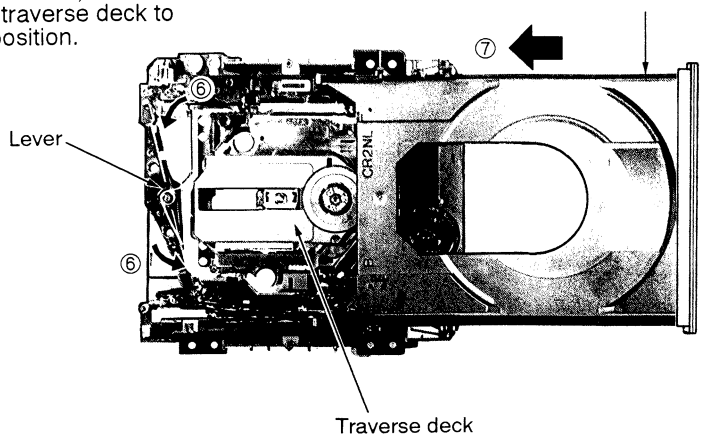
Step 5
Latch the claw to the disc tray.

Step 6
Supporting the disc tray manually, engage the drive gear (B) ass'y with the gear and then slide to stop the disc tray.

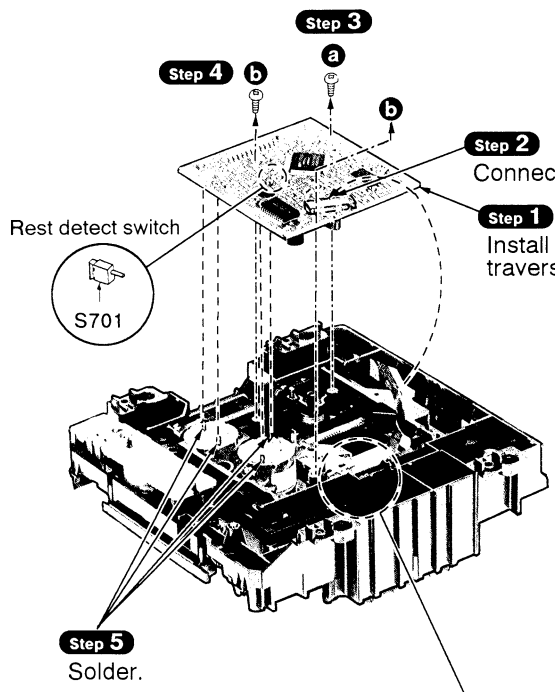


Step 7 Operate the lever, and then locate the traverse deck to "DOWN" position.

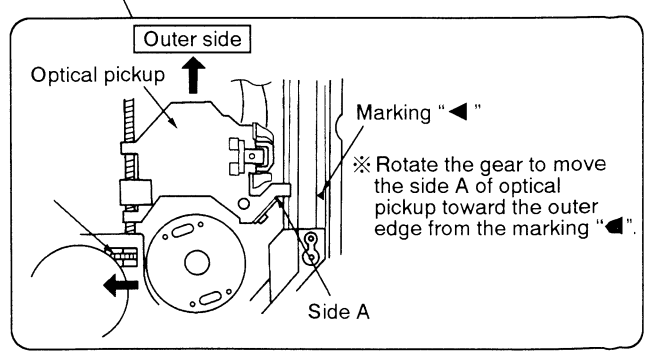
Step 8 Press the disc tray.



Installation of the servo P.C.B. after replacement

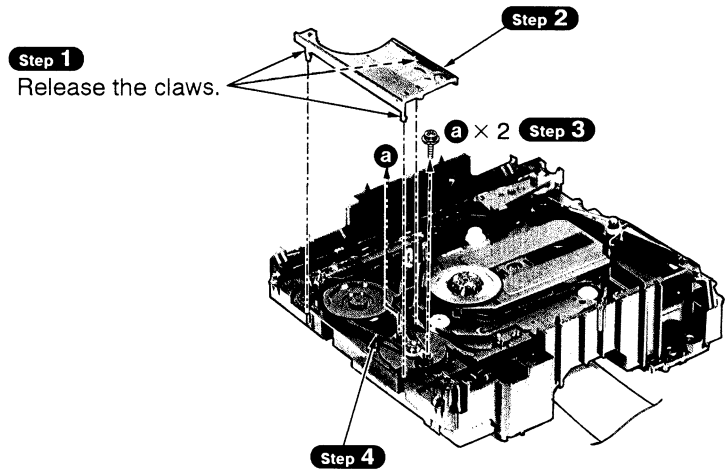


NOTE
Before installing the servo P.C.B., move the optical pickup toward the outer edge from the mark "◀". [Otherwise, the rest detect switch (S701) mounted on the servo P.C.B. may be damaged.]

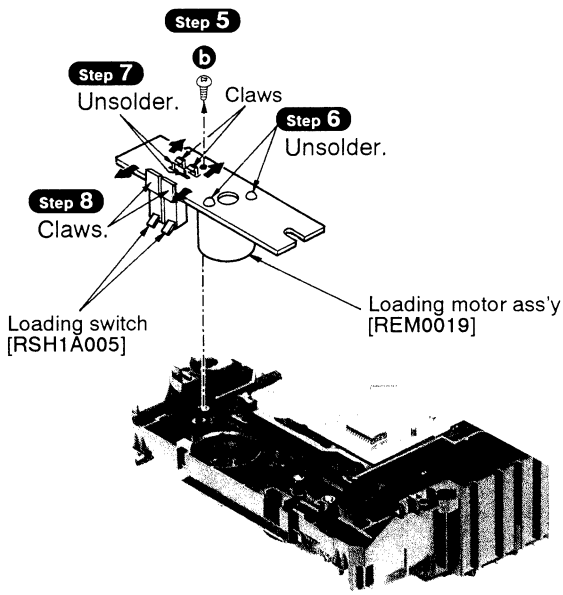

Outer side
Optical pickup
Marking "◀"
※Rotate the gear to move the side A of optical pickup toward the outer edge from the marking "◀".
Side A

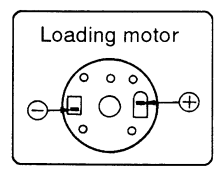
2. Replacement for the belt, loading motor ass'y and loading switch

- Follow the Step 1 ~ Step 6 of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.
- Follow the Step 1 , Step 2 of the item 2 in checking procedure for each P.C.B. on page 7.
- Follow the Step 1 ~ Step 9 of the item 1 in main component procedures on pages 7 and 8.



Remove the belt [RMG0158].





■Schematic Diagram

Page

A SERVO CIRCUIT 14, 15
B LOADING MOTOR CIRCUIT 16
C MAIN CIRCUIT 16, 17
D OPERATION CIRCUIT 16
E POWER SUPPLY CIRCUIT 17

● This schematic diagram may be modified at any time with the development of new technology.

Notes:

- **S701** : Rest detect switch in "OFF" position
- **S790** : Tray open detect switch in "OFF" position
- **S791** : Tray close detect switch in "OFF" position
- **S801** : Tray open/close detect switch (⏏ OPEN/CLOSE) in "OPEN" position
- **S802** : Pause switch (❚❚)
- **S803** : F. Skip/Search switch (▶▶/▶▶❙)
- **S804** : Play switch (▶)
- **S805** : Stop switch (■)
- **S806** : R. Skip/Search switch (❙◀◀/◀◀)
- **S807** : Random play switch (RANDOM)
- **S808** : AI edit switch (AI EDIT)
- **S809** : Repeat switch (REPEAT)

● Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark : CD STOP
( ) : CD PLAY [1kHz, L + R, 0 dB]

● Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

● **Caution!**
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
Cover the parts boxes made of plastics with aluminum foil.
Ground the soldering iron.
Put a conductive mat on the work table.
Do not touch the legs of IC or LSI with the fingers directly.

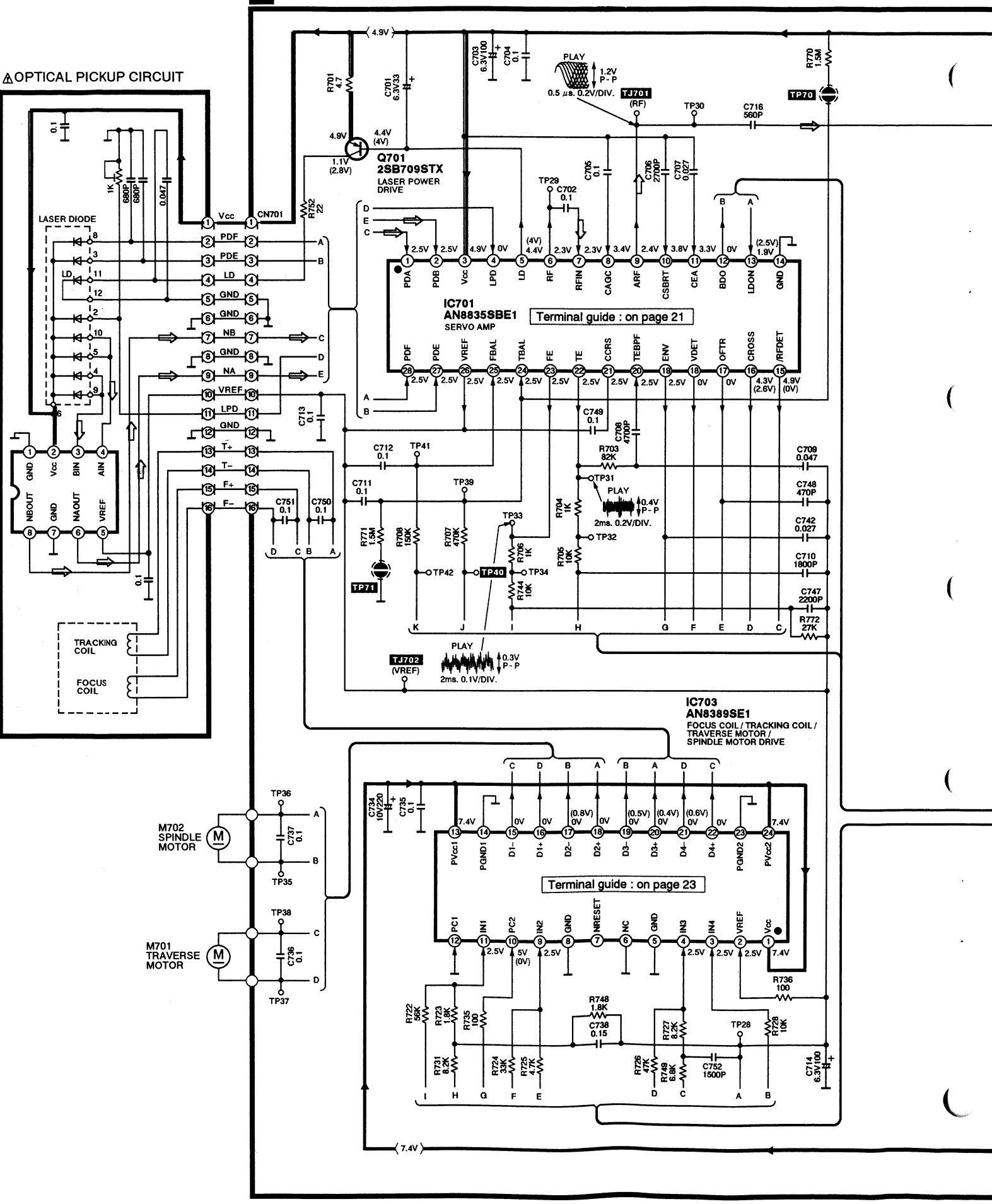
● **Voltage and signal line**

: Positive voltage line

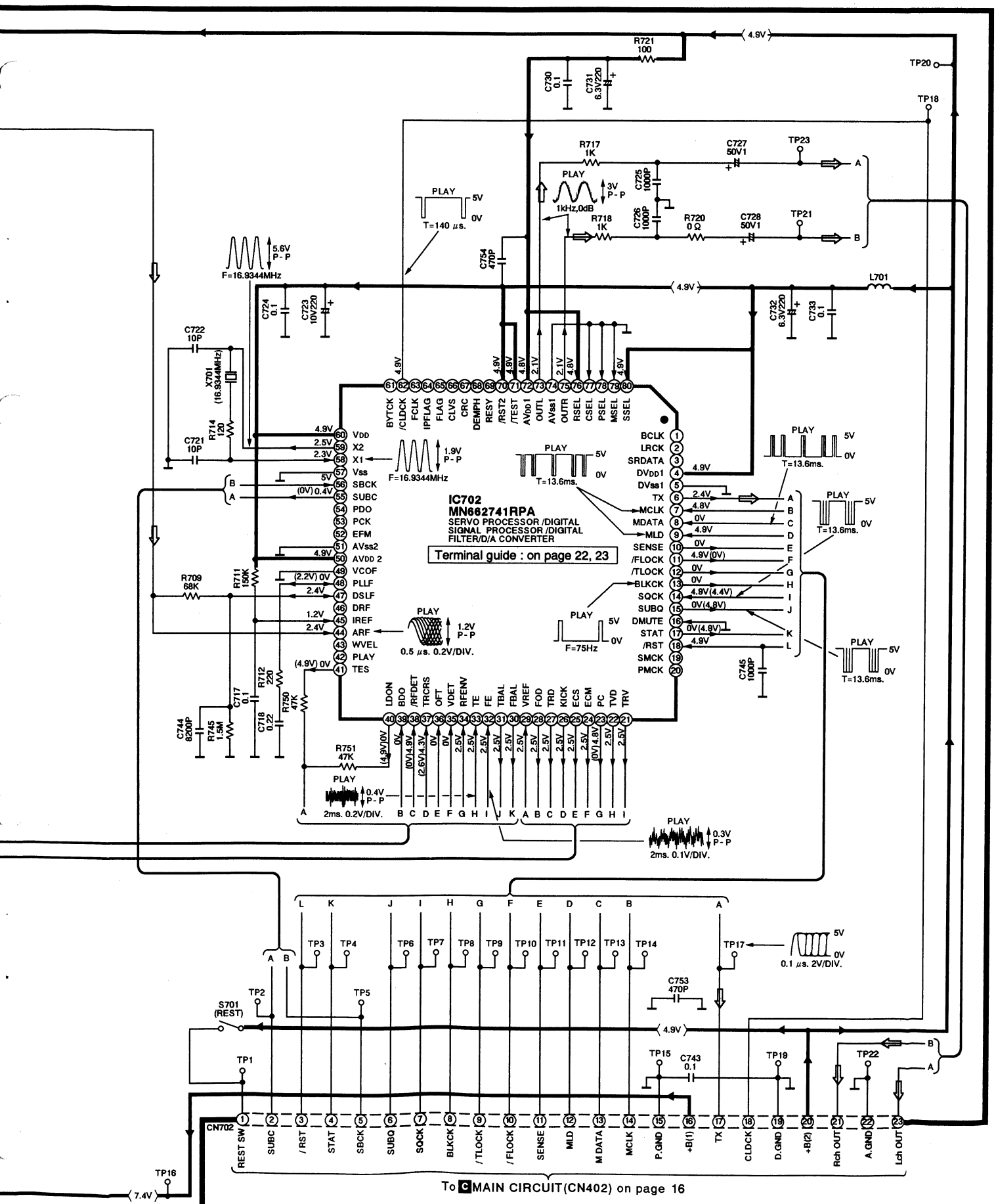
: Negative signal line

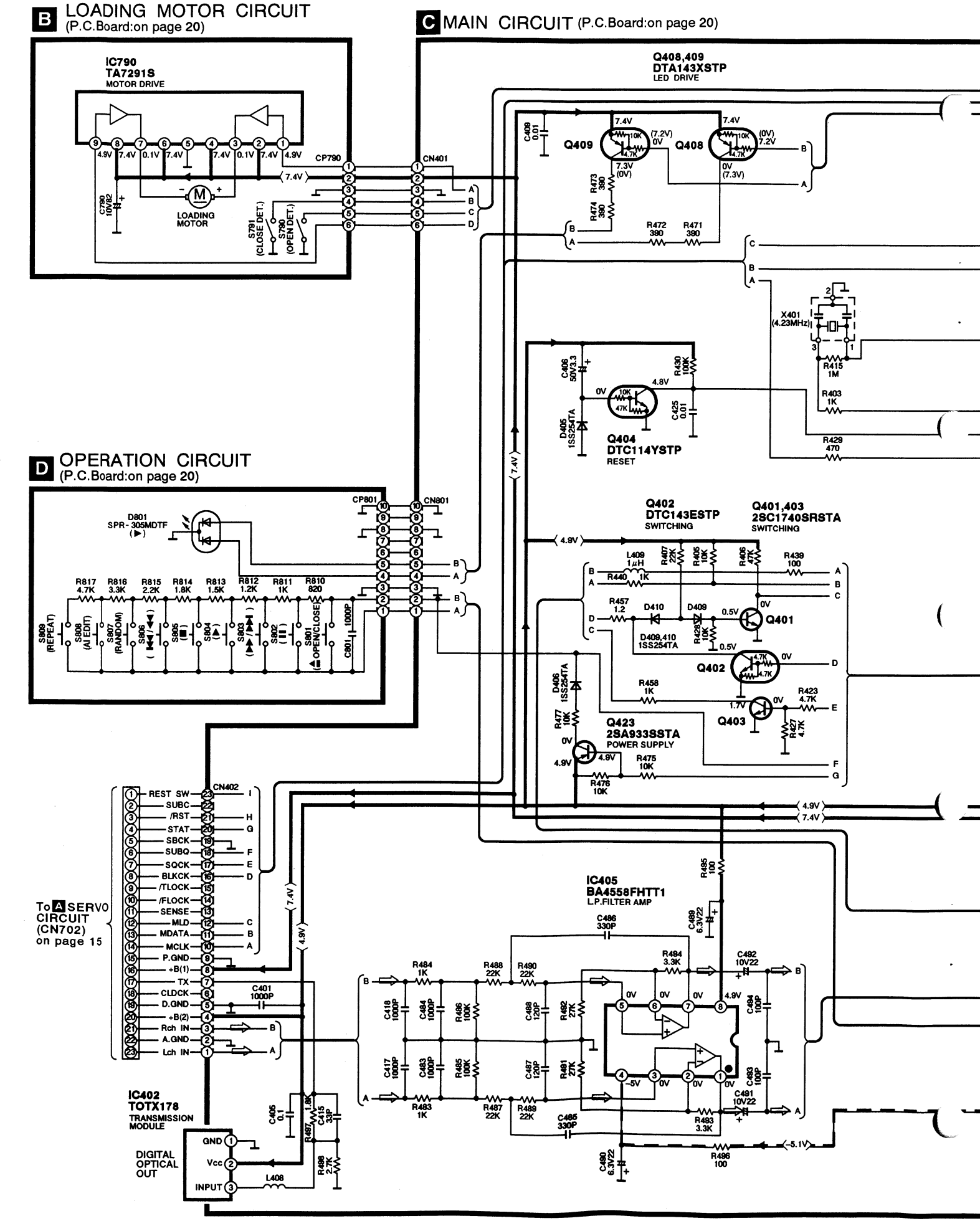
: CD signal line

A SERVO CIRCUIT (P.C.Board:on page 19)

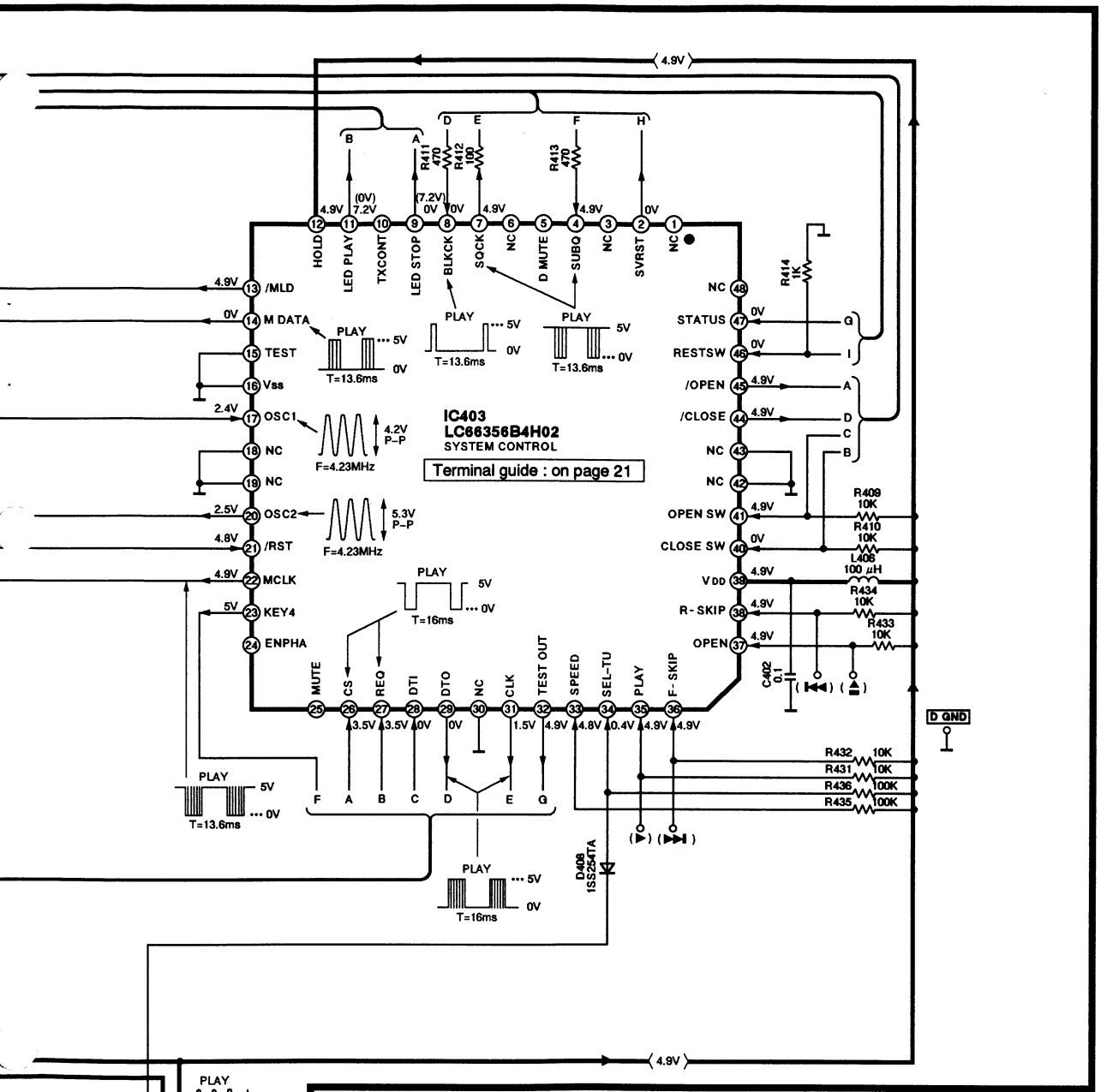


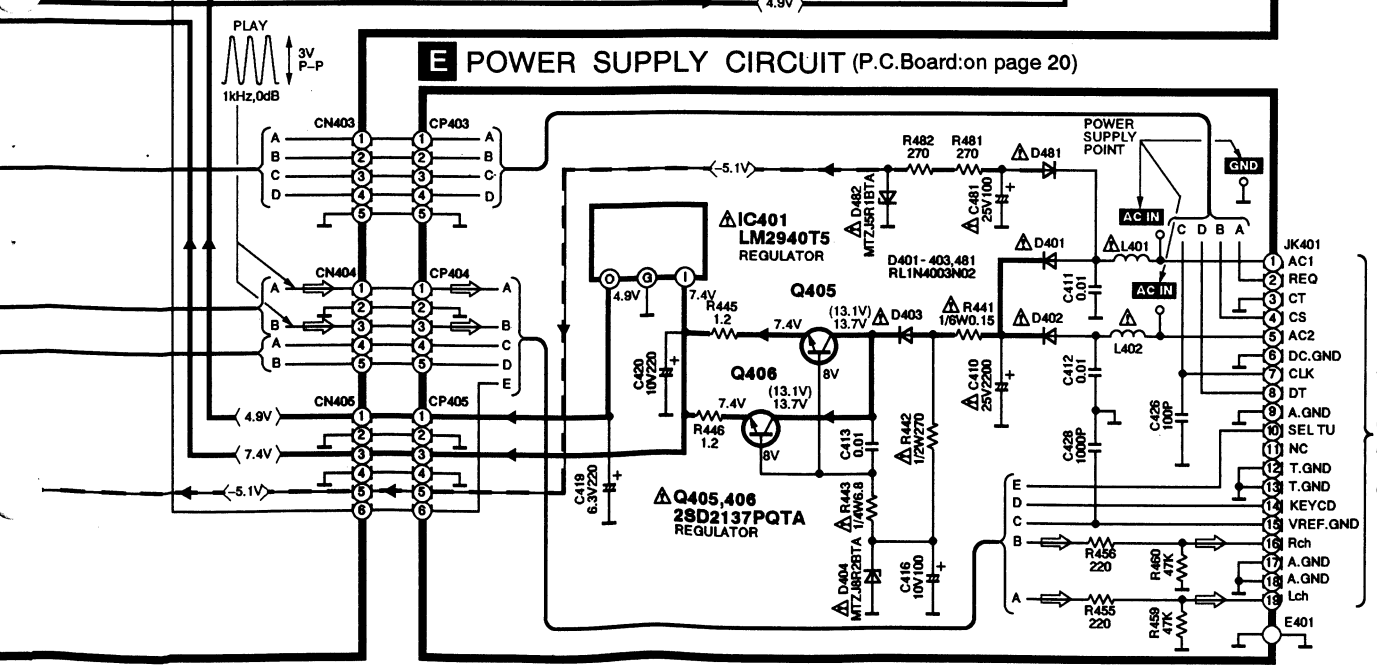
: Positive voltage line : CD signal line



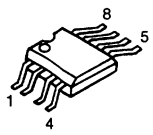
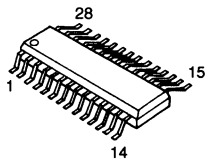
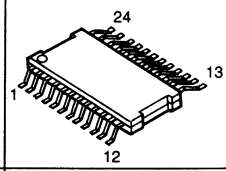
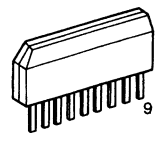
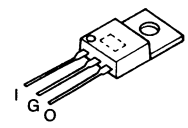
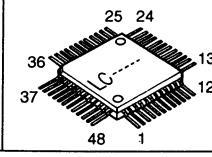
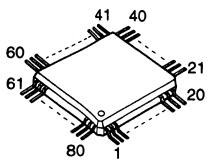
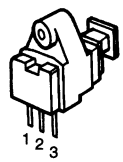
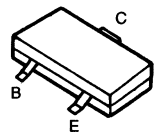
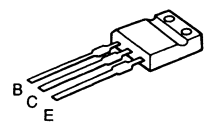
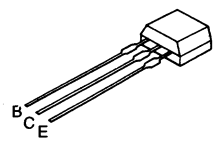
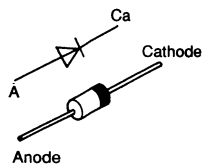
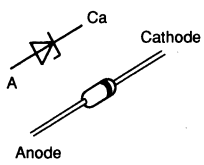
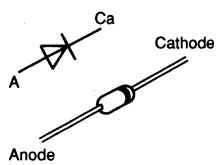
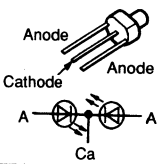

B LOADING MOTOR CIRCUIT
(P.C.Board:on page 20)
C MAIN CIRCUIT (P.C.Board:on page 20)
D OPERATION CIRCUIT
(P.C.Board:on page 20)
IC790
TA7291S
MOTOR DRIVE
LOADING MOTOR
S791 (CLOSE DET.)
S790 (OPEN DET.)
CP790
CN401
Q408,409
DTA143XSTP
LED DRIVE
Q409
Q408
X401 (4.23MHz)
Q404
DTC114YSTP
RESET
D801
SPR-305MDTF
CP801
CN801
Q402
DTC143ESTP
SWITCHING
Q401,403
2SC1740SRSTA
SWITCHING
Q401
Q402
Q403
Q423
2SA933SSTA
POWER SUPPLY
IC405
BA4558FHTT1
L.P.FILTER AMP
CN402
REST SW
SUBC
/RST
STAT
SBCK
SUBQ
SQCK
BLKCK
/TLOCK
/FLOCK
SENSE
MLD
MDATA
MCLK
P.GND
+B(1)
TX
CLDCK
D.GND
+B(2)
Rch IN
A.GND
Lch IN
To A SERVO CIRCUIT (CN702) on page 15
IC402
TOTX178
TRANSMISSION MODULE
DIGITAL OPTICAL OUT
GND
Vcc
INPUT
L408

: Positive voltage line : Negative signal line : CD signal line

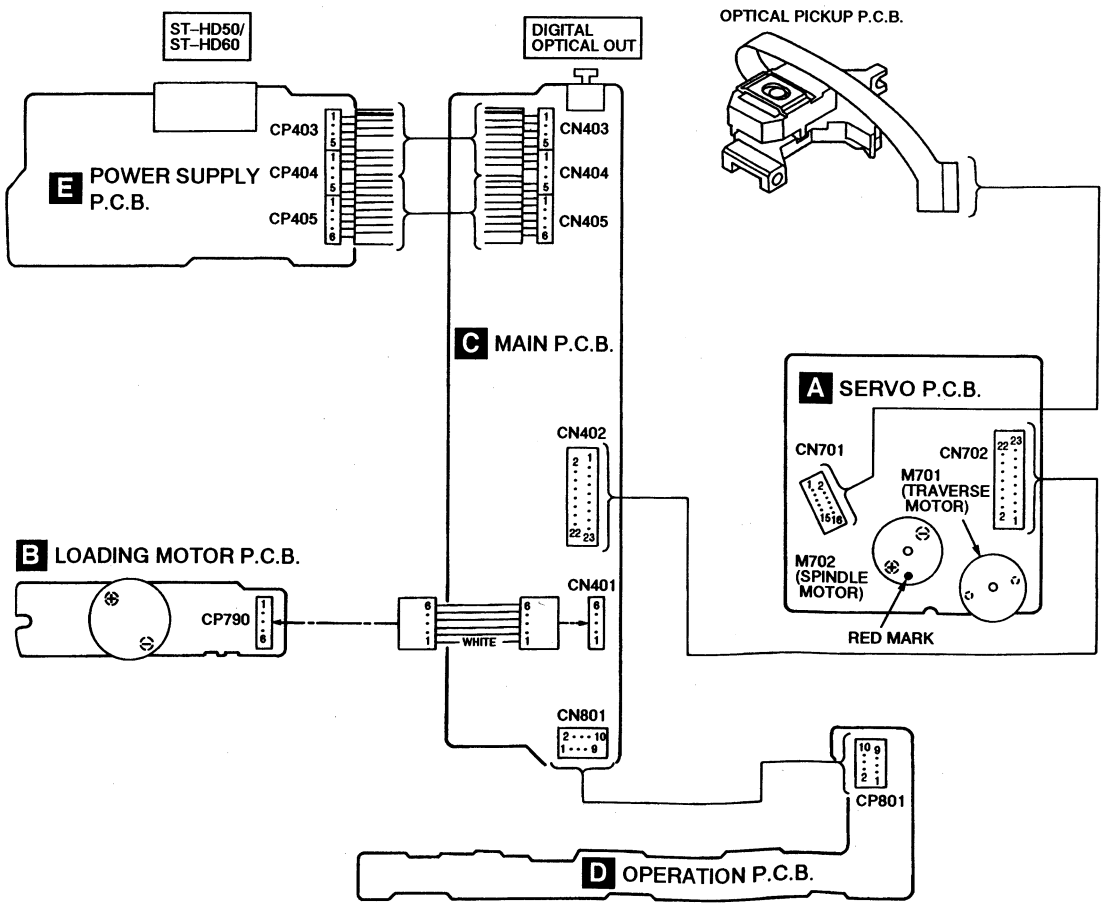




■ Type Illustration of ICs, Transistors and Diodes

BA4558FHTT1 	AN8835SBE1 	AN8389SE1 	TA7291S 	LM2940T5M 	LC66356B4H02 
MN662741RPA 	TOTX178 	2SB709STX 	2SD2137PQTA 		2SC1740SRSTA 2SA933SSTA DTC114YSTP DTC143ESTP DTA143XSTP
RL1N4003N02 	MTZJ5R1BTA MTZJ8R2BTA 	1SS254TA 	SPR-305MDTF 		

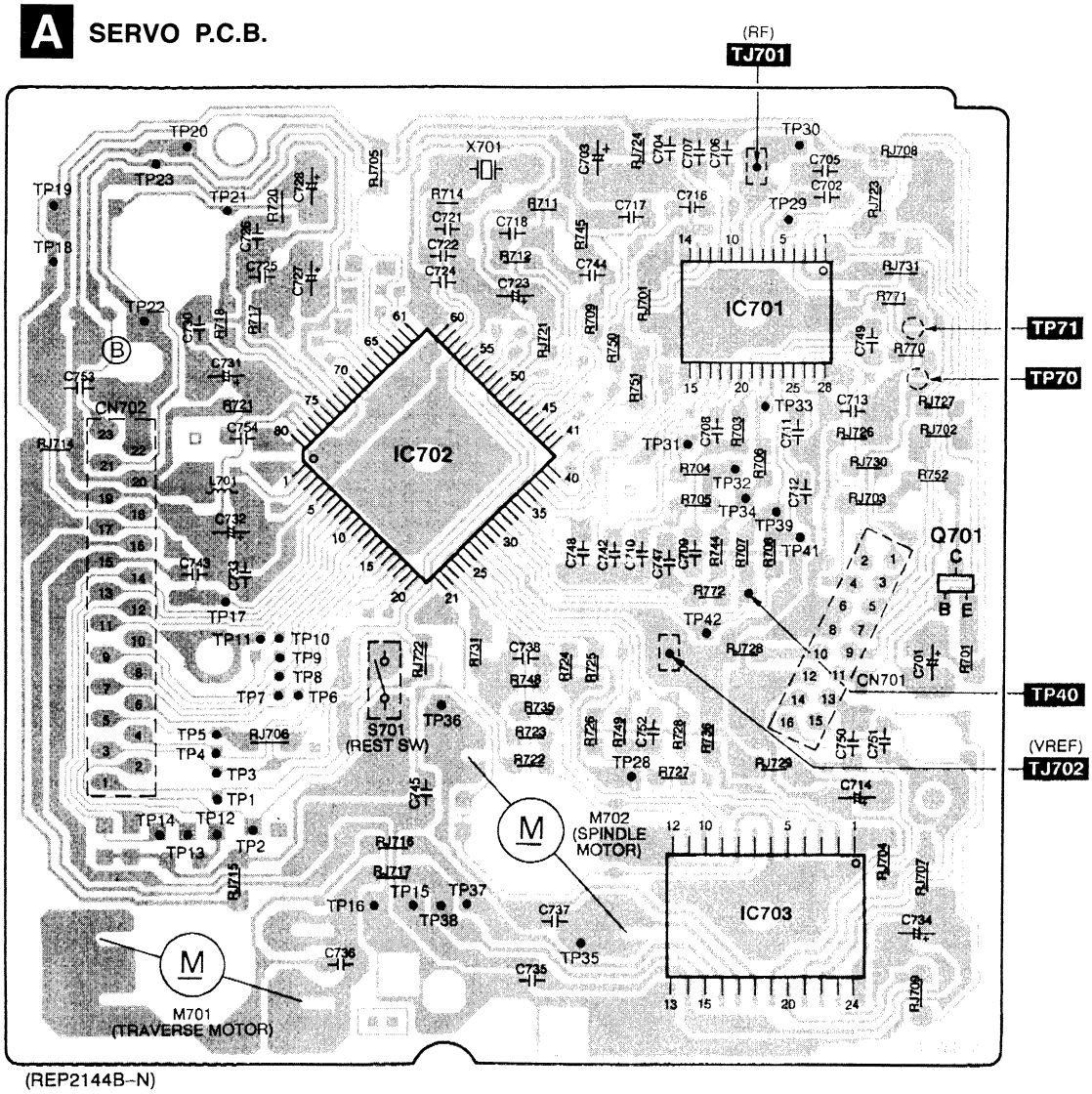
■ Wiring Connection Diagram



■ Printed Circuit Board Diagram

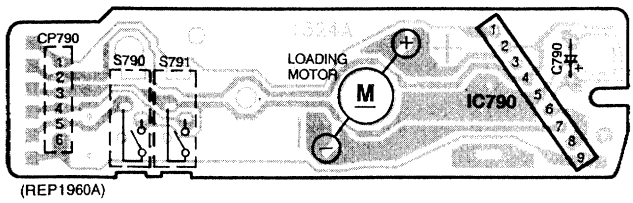
● This circuit board diagram may be modified at any time with the development of new technology.

A **SERVO P.C.B.**



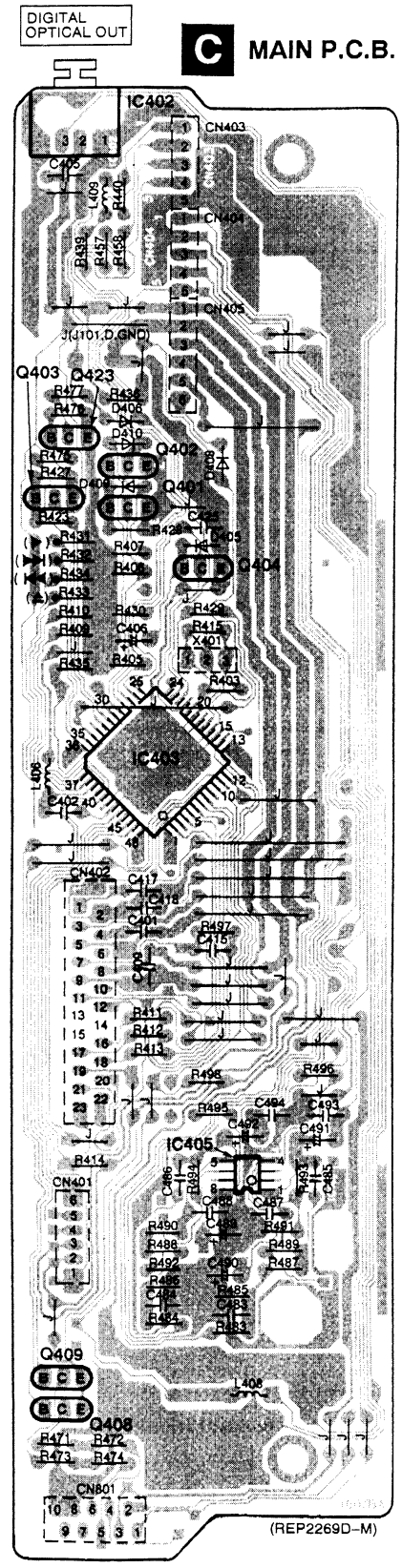
(REP2144B-N)

B LOADING MOTOR P.C.B.



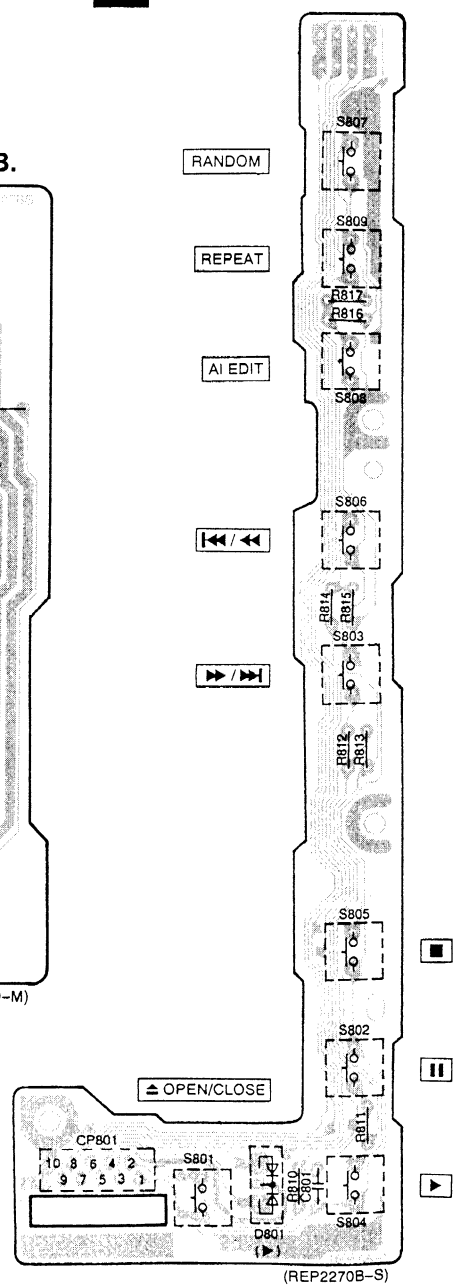
(REP1960A)

C MAIN P.C.B.



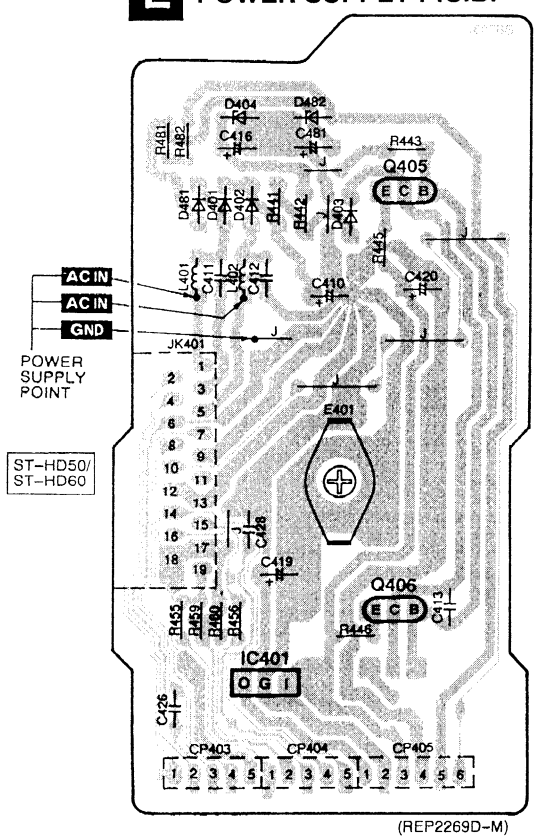
(REP2269D-M)

D OPERATION P.C.B.



(REP2270B-S)

E POWER SUPPLY P.C.B.



(REP2269D-M)

■ Terminal Function of IC's

● IC403 (LC66356B4H02): System Control

Pin No.	Terminal Name	I/O	Function
1	NC	—	Not used, open
2	SVRST	O	Reset signal output terminal
3	NC	—	Not used, open
4	SUBQ	I	Sub-code Q data input terminal
5	DMUTE	—	Not used, open
6	NC	—	Not used, open
7	SQCK	O	Sub-code Q resistor clock output terminal
8	BLKCK	I	Sub-code block clock input terminal (f = 75 Hz)
9	LED STOP	O	LED drive signal output terminal
10	TX CONT	—	Not used, open
11	LED PLAY	O	LED drive signal output terminal
12	HOLD	I	Not used, connected power supply
13	/MLD	O	Command load signal output terminal
14	MDATA	O	Command data signal output terminal
15	TEST	—	Test terminal
16	VSS	—	GND terminal
17	OSC1	I	Crystal OSC terminal (f = 4.2336 MHz)
18,19	NC	—	Not used, connected to GND
20	OSC2	O	Crystal OSC terminal (f = 4.2336 MHz)
21	/RST	I	Reset signal input terminal
22	MCLK	O	Command clock signal output terminal
23	KEY4	O	Key switch det. terminal
24	EMPHA	—	Not used, open
25	MUTE	—	Not used, open
26	CS	I	Communication chip select signal input terminal
27	REQ	I	Communication request signal input terminal
28	DTI	I	Communication data signal input/output terminal
29	DTO	O	
30	NC	—	Not used, open
31	CLK	O	Communication clock signal output terminal
32	TEST OUT	O	Not used, connected to power supply
33	SPEED	I	Not used, connected to resistor
34	SEL-TU	I	Communication data signal input terminal
35	PLAY	I	Not used, connected to resistor
36	F-SKIP	I	Not used, connected to resistor
37	OPEN	I	Not used, connected to resistor
38	R-SKIP	I	Not used, connected to resistor
39	VDD	I	Power supply input terminal
40	CLOSE SW	I	Disc tray "CLOSE" det. input terminal
41	OPEN SW	I	Disc tray "OPEN" det. input terminal
42,43	NC	—	Not used, connected to GND
44	/CLOSE	O	Loading motor "CLOSE" signal output terminal
45	/OPEN	O	Loading motor "OPEN" signal output terminal
46	RESTSW	I	Rest position det. input terminal
47	STATUS	I	Status signal input terminal
48	NC	—	Not used, open

● IC701 (AN8835SBE1): Servo Amp.

Pin No.	Terminal Name	I/O	Function
1	PDA	I	Focus (A-ch) signal input terminal
2	PDB	I	Focus (B-ch) signal input terminal
3	VCC	I	Power supply terminal
4	LPD	I	Laser PD signal input
5	LD	O	Laser power auto control signal output
6	RF	O	RF amp. terminal
7	RF IN	I	AGC input terminal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal output
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Dropout detection control signal output
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	GND	—	GND terminal
15	/RFDET	O	RF detection signal output ("L": det.)
16	CROSS	O	Tracking error zero cross output
17	OFTR	O	Off track detection signal output ("H": det.)
18	VDET	O	Vibration detection signal output ("H": det.)
19	ENV	O	Envelope output terminal
20	TEBPF	I	Vibration detection signal input ("H": det.)
21	CCRS	I	CROSS capacitor connection terminal
22	TE	O	Tracking error signal output
23	FE	O	Focus error signal output
24	TBAL	I	Tracking balance adjustment signal input
25	FBAL	I	Focus balance adjustment signal input
26	VREF	O	Reference voltage output
27	PDE	I	Tracking signal (E-ch) input terminal
28	PDF	I	Tracking signal (F-ch) input terminal

● **IC702 (MN662741RPA): Servo Processor, Digital Signal Processor, Digital Filter, D/A Converter**

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data
2	LRCK	O	L/R clock signal output
3	SRDATA	O	Serial data output
4	DVDD1	—	Power supply input (for digital circuit)
5	DVss1	—	GND (for digital circuit)
6	TX	O	Digital audio interface signal output
7	MCLK	I	Microprocessor command clock signal input (Latches data at first transition)
8	MDATA	I	Microprocessor command data signal input
9	MLD	I	Microprocessor command load signal input
10	SENSE	O	Sense signal output (OFT, FESL, MAGEND, NAJEND, POSAD, SFG) (Not used, open)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed) (Not used, open)
13	BLKCK	O	Sub-code block clock signal output (fBLKCK = 75 Hz during normal playback)
14	SQCK	I	External clock signal input for sub-code Q resister
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H": Mute)
17	STAT	O	Status signal output (CRC, CUE, CLVS, TTSTVP, FCLV, SQCK)
18	/RST	I	Reset signal input
19	SMCK	—	1/2-divided clock signal of crystal oscillating at MSEL = "H" (fSMCK = 8.4672 MHz) 1/4-divided clock signal of crystal oscillating at MSEL = "L" (fSMCK = 4.2336 MHz) (Not used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK = 88.2 kHz) (Not used, open)
21	TRV	O	Traverse forced feed output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal output ("L": ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD, ECS, TRD, FOD, FBAL, TBAL) reference voltage input
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H": detection)
36	OFT	I	Off-track signal input ("H": off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY) (Not used, open)
43	WVEL	O	Double speed status signal output ("H": Double speed) (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (Not used, open)
47	DSLF	I/O	DSL loop filter
48	PLLF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter
50	AVDD2	—	Power supply input (for analog circuit)
51	AVss2	—	GND (for analog circuit)
52	EFM	—	EFM signal output (Not used, open)
53	PCK	—	PLL extraction clock output (fPCK= 4.321 MHz during normal playback) (Not used, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (Not used, open)
55	SUBC	O	Sub-code serial data output
56	SBCK	I	Clock input for sub-code serial data
57	Vss	—	GND
58	X1	I	Crystal oscillating circuit input (f = 16.9344 MHz)
59	X2	O	Crystal oscillating circuit output (f = 16.9344 MHz)
60	VDD	—	Power supply input (for oscillating circuit)
61	BYTCK	—	Byte clock output (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal output (fCLDCK = 7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (fFCLK = 7.35 kHz, double = 14.7 kHz) (Not used, open)
64	IPFLAG	O	Interpolation flag output ("H": Interpolation)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (Not used, open)
69	RESY	—	Frame re-synchronizing signal output (Not used, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input

● **IC702 continued**

Pin No.	Terminal Name	I/O	Function
72	AVDD1	—	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVss1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level: RSEL = "H") (at "L" level: RSEL = "L")
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344 MHz, "H": 33.8688 MHz)
78	PSEL	I	Test terminal (Normal: "L") (Not used, connected to GND)
79	MSEL	I	"SCMK" terminal frequency select ("L": SCMK = 4.2336MHz) (Not used, connected to GND)
80	SSEL	I	"SCMK" terminal mode select ("H": Q code buffer) (Not used, connected to power supply)

● **IC703 (AN8389SE1): Focus/Tracking Coil Drive Traverse/Spindle Motor Drive**

Pin No.	Terminal Name	I/O	Function
1	Vcc	—	Power supply
2	VREF	I	VREF input
3	IN4	I	Focus driver (4) input
4	IN3	I	Tracking driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	—	Reset input (Not used, open)
8	GND	—	Ground connection
9	IN2	I	Spindle motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Traverse motor driver (1) input
12	PC1	I	PC1 (power cut) input
13	PVcc1	—	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Traverse motor driver (1) reverse-action output
16	D1+	O	Traverse motor driver (1) forward-action output
17	D2-	O	Spindle motor driver (2) reverse-action output
18	D2+	O	Spindle motor driver (2) forward-action output
19	D3-	O	Tracking actuator (3) reverse-action output
20	D3+	O	Tracking actuator (3) forward-action output
21	D4-	O	Focus actuator (4) reverse-action output
22	D4+	O	Focus actuator (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVcc2	—	Power supply (2) for driver

■ Error Code Display and Servo Adjustment Function

This unit has an error code display function, so that if the unit operates incorrectly, the fault is displayed using an error code on the FL display of the tuner (ST-HD50 or ST-HD60). It also has a servo adjustment function for displaying the status of servo system functions (Focus, Tracking, CLV Servo) on the tuner's FL display.
The system control IC and FL display are part of the tuner so make sure the system has been connected properly before using three functions. (This unit can be operated independently, although the error code display and servo adjustment functions cannot be used.)
Use these two functions for guidance during fault diagnosis and repair.

Note:
Check beforehand for scratching or soiling of the test disc (SZZP1054C), and soiling or other problems with the pickup lens.

● Error code display procedure

Automatic adjustment results

Turn the power ON and select the CD mode by press the select switch of the tuner

↓

Load the test disc (SZZP1054C).

↓

Hold down the STOP button for at least 2 seconds, and then press the ►►/►►I (F.SKIP/SEARCH) button for at least 2 seconds while continuing to hold down the STOP button.

↓

A servo section error code is displayed. (See **Table 2.**)
Use this error code display as a guideline for finding the malfunction point in the servo circuitry. If the error code **"E-00"** is displayed, the unit is "OK (No problem)."

Checking the mechanism switches

If there are mechanism errors, mechanism OK/NG error code is displayed. (See **Table 1.**)
This error code can be used diagnose whether or not the mechanism is OK. If there are multiple errors, these can be displayed successively by pressing the F. SKIP button.

↓

Remove the disc and turn the power OFF. (The error code display mode is canceled.)

● Servo adjustment procedure

Turn the power ON and select the CD mode by press the select switch of the tuner

↓

Load the test disc (SZZP1054C).

↓

Hold down the STOP button for at least 2 seconds, and then press the ►►/►►I (F.SKIP/SEARCH) button for at least 2 seconds while continuing to hold down the STOP button.

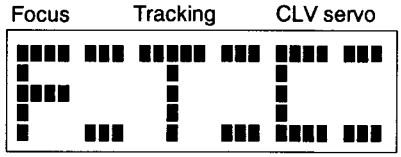
↓

Press the ► (PLAY) button, and play for 10 seconds.

↓

Servo adjustment results are displayed.

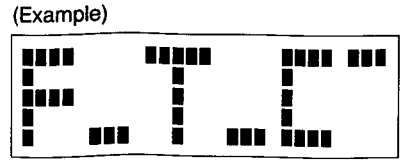
Focus Tracking CLV servo



↓

Remove the disc and turn the power OFF.

(Example)



⇒ Normal

	"L" level	"H" level
Focus system	normal	defective
Tracking system	normal	defective
CLV servo system	defective	normal

● Table 1

FL display	Symptom	Cause
H-15	When CD tray opens, it closes by itself.	Disc tray "Open" detection switch (S4) fault.
H-16	When CD tray close, it opens by itself.	
F-15	Does not play, even when CD play button is pressed.	Pickup rest position detection switch (S701) fault.
F-16	Traverse pushes up disc tray.	Up position detection switch (S3) fault.
F-26	Does not move even when " ▶ " (PLAY) button is pressed.	System control or servo processor IC (IC403, IC702) fault.

● Table 2

※ The unit is satisfactory if the error code is **"E-00"** or **"E02"**.
※ Before testing, check that the test disc is free of scratches and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Location	Signal name	PLAY	STOP
E-01	Focus and tracking offset adjustments not completed in specified time period.	①Clocks X1 and X2, power supply V_{DD}, and reset (/RST), all on IC702. ②MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller.	IC702-8 pin	MDATA	PLAY 5 V 0 V T=13.6 ms.	0 V
			IC702-7 pin	MCLK	PLAY 5 V 0 V T=13.6 ms.	4.8 V
			IC702-9 pin	MLD		4.9 V
			IC702-10 pin	SENSE	0 V	0 V
			IC702-18 pin	/RST	4.9 V	4.9 V
			IC702-58 pin	X1	1.9Vp-p F=16.9344 MHz	1.9Vp-p F=16.9344 MHz
			IC702-59 pin	X2	5.6Vp-p F=16.9344 MHz	5.6Vp-p F=16.9344 MHz
E-02 E-03 E-05 E-06 E-07 E-09 E-0A E-0B E-0D E-0E E-0F	Disc play unstable	①Scratches or contaminants on disc surface ②Focus and Tracking servo circuits (check waveforms, voltages, and part values.) ③Spindle driver circuit ④Optical pickup	IC702-32 pin	F E	PLAY 0.3Vp-p 2 ms. 0.1 V/DIV.	2.5 V
			IC702-33 pin	T E	PLAY 0.4Vp-p 2 ms. 0.2 V/DIV.	2.5 V
			IC702-28 pin	FOD	2.5 V	2.5 V
			IC702-27 pin	TRD	2.5 V	2.5 V
			IC702-26 pin	KICK	2.5 V	2.5 V
			IC702-11 pin	/FLOCK	0 V	4.9 V
			IC702-38 pin	/RF DET	0 V	4.9 V
			TJ701	R F	PLAY 1.2 Vp-p 0.5 μs. 0.2 V/DIN	3.9 V
			IC702-17 pin	STAT	4.9 V	0 V
E-04 E-08 E-0C	Focus or Tracking gain adjustment not completed in the specified time period.	①Scratches or contaminants on disc surface ②Focus and tracking servo circuit (check waveforms, voltages, and part values.) ③Optical pickup	IC702-32 pin	F E	PLAY 0.3Vp-p 2 ms. 0.1 V/DIV.	2.5 V
			IC702-33 pin	T E	PLAY 0.4Vp-p 2 ms. 0.2 V/DIV.	2.5 V
			IC702-36 pin	O F T	0 V	0 V
			IC702-12 pin	/TLOCK	0 V	0 V

■ To Supply Power Source

Cautions:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
  With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

This unit SL-HD60 is designed to operate on power supplied from the Amplifier SE-HD50 or SE-HD60 through the Tuner ST-HD50 or ST-HD60. When connecting the unit to other system components, do not connect to the Amplifier SE-HD50 or SE-HD60 directly. Be sure to connect this unit through the Tuner ST-HD50 or ST-HD60.
When operating the unit SL-HD60 alone for testing and servicing, without having power supplied from the Amplifier SE-HD50 or SE-HD60 and the Tuner ST-HD50 or ST-HD60, use the following method.

Power Supply to This Unit Alone

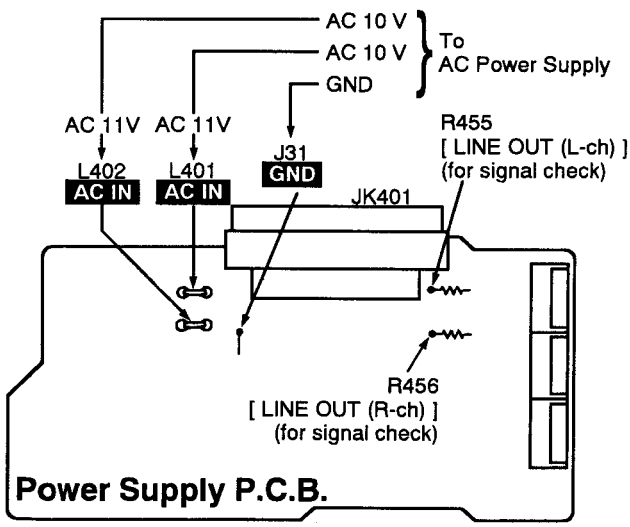
1. Short-circuit the section **AC IN (L401)**, **GND (J31)** and **AC IN (L402)**.
2. AC 11V supply to the short point just now.

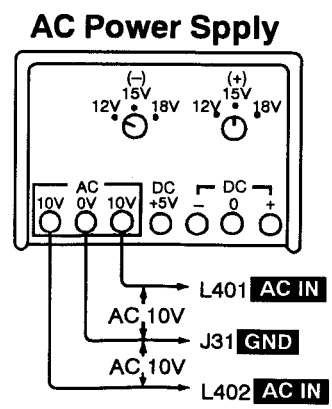
Operate to This Unit Alone

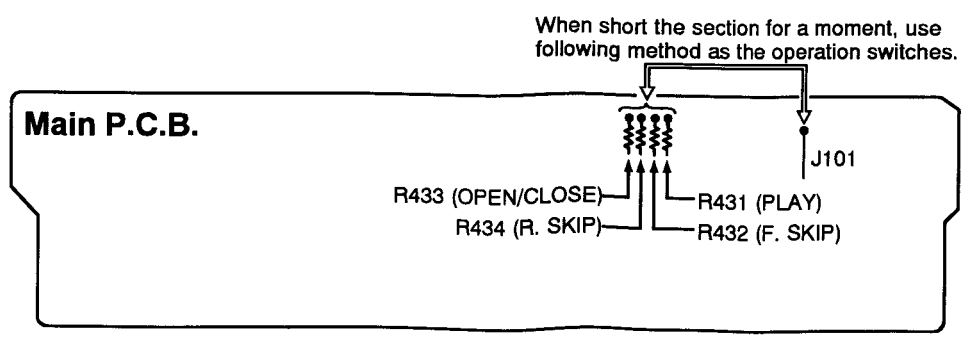
- If this unit SL-HD60 operates by alone, become to not operate the operation switches of the front panel.
  Therefore use following method as the operation switches.
  When short the section following points for a moment, be able to operate as follows.
  short the section between **R431** and **J101** ..... **PLAY**
  short the section between **R432** and **J101** ..... **F. SKIP**
  short the section between **R433** and **J101** ..... **OPEN/CLOSE of the Disc Tray**
  short the section between **R434** and **J101** ..... **R. SKIP**

To Check Signals

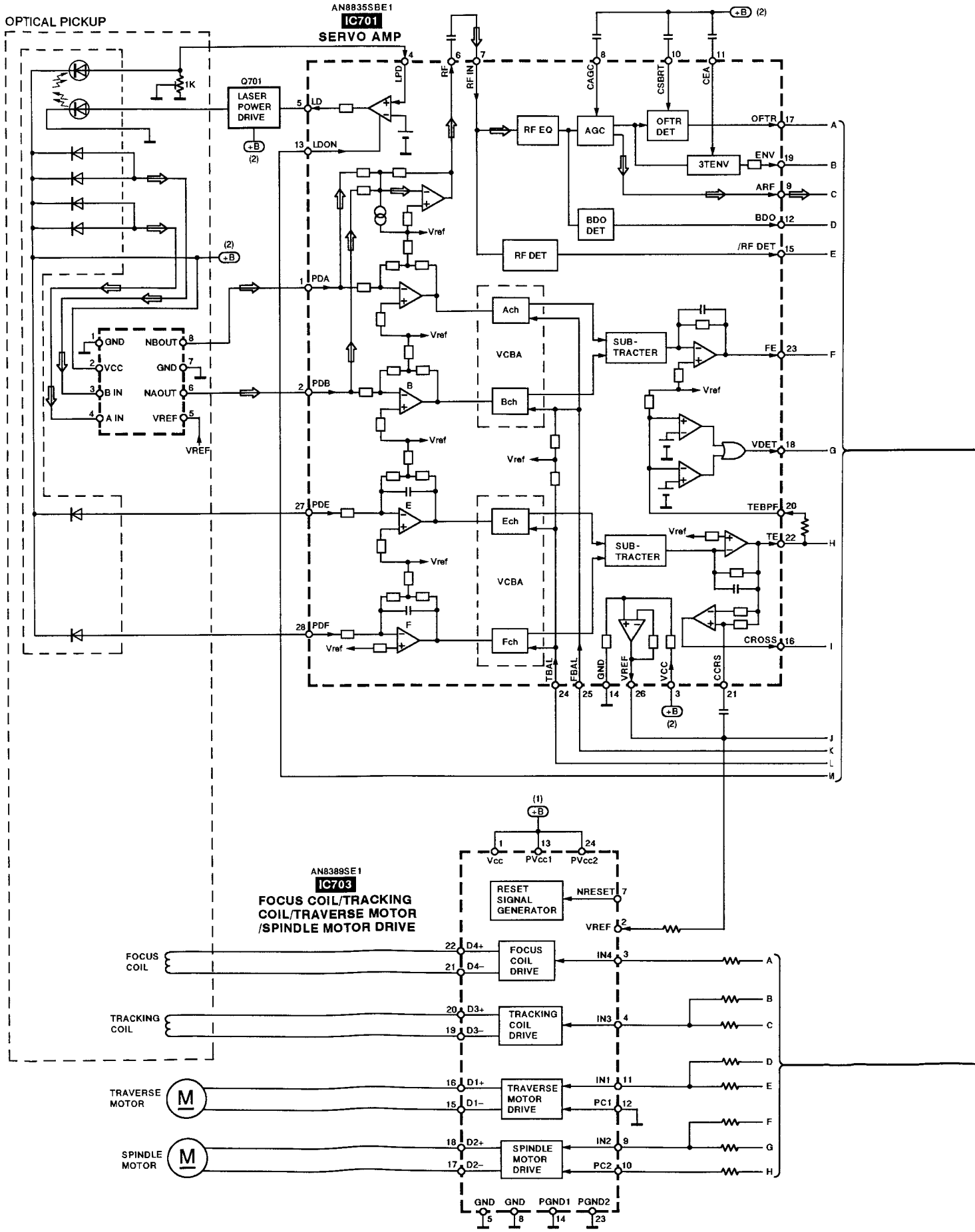
Connect the oscilloscope or the speaker with built-in amplifier to the section between **R455 [LINE OUT (L-ch)]** and the **J31 (GND)**, as well as the section between **R456 [LINE OUT (R-ch)]** and the **J31 (GND)**, and check if the signals are outputting from this unit as follow.

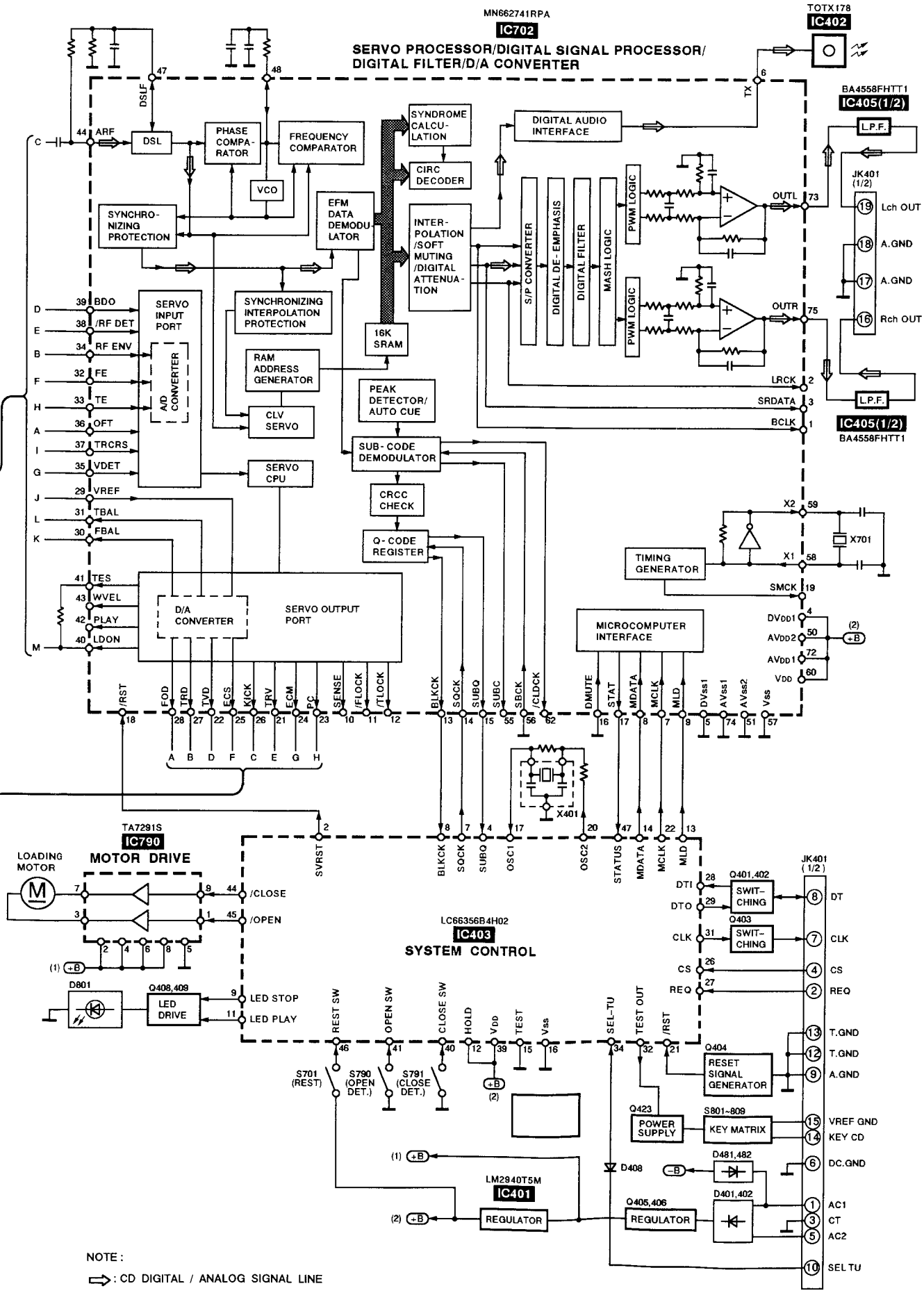




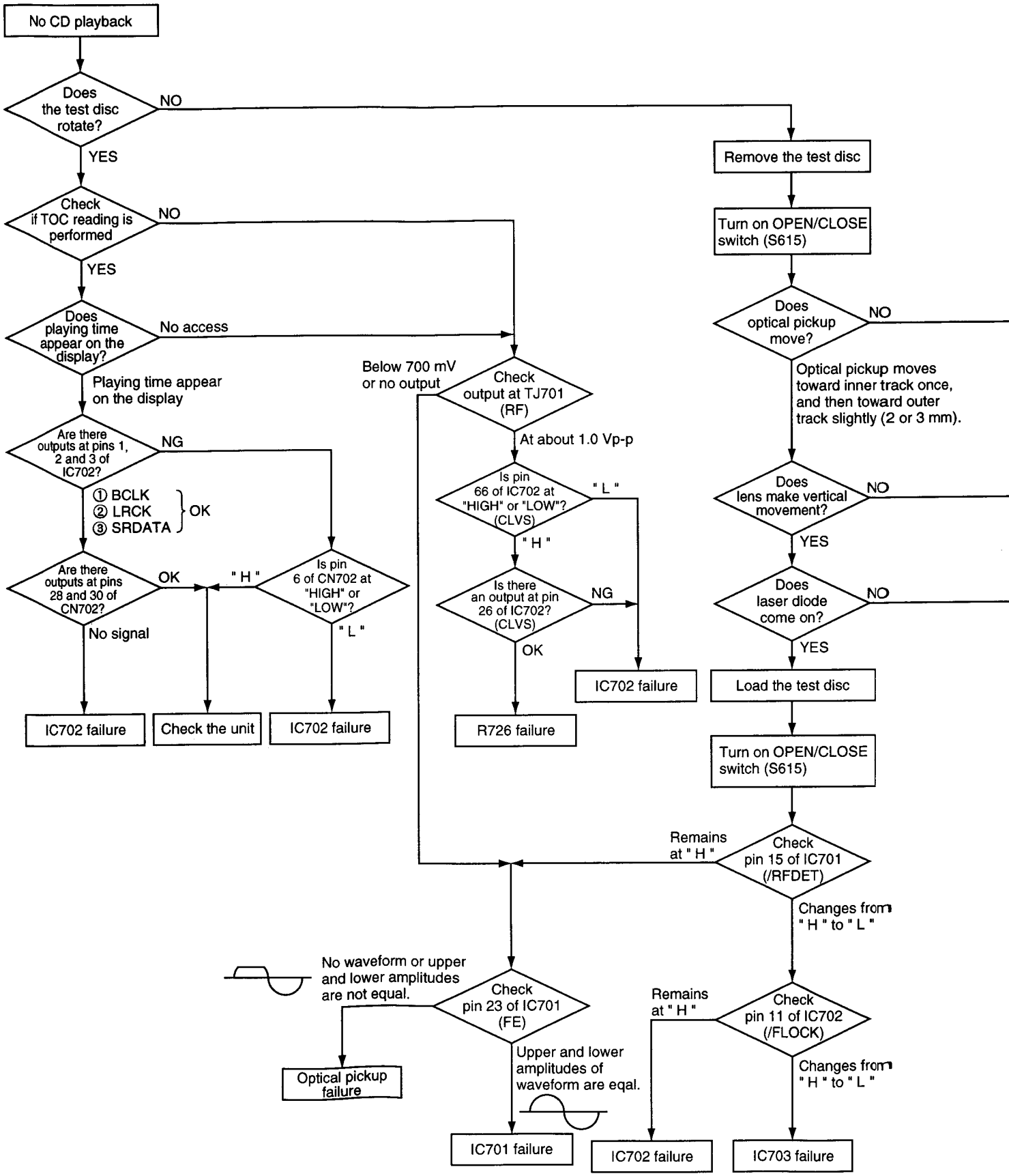


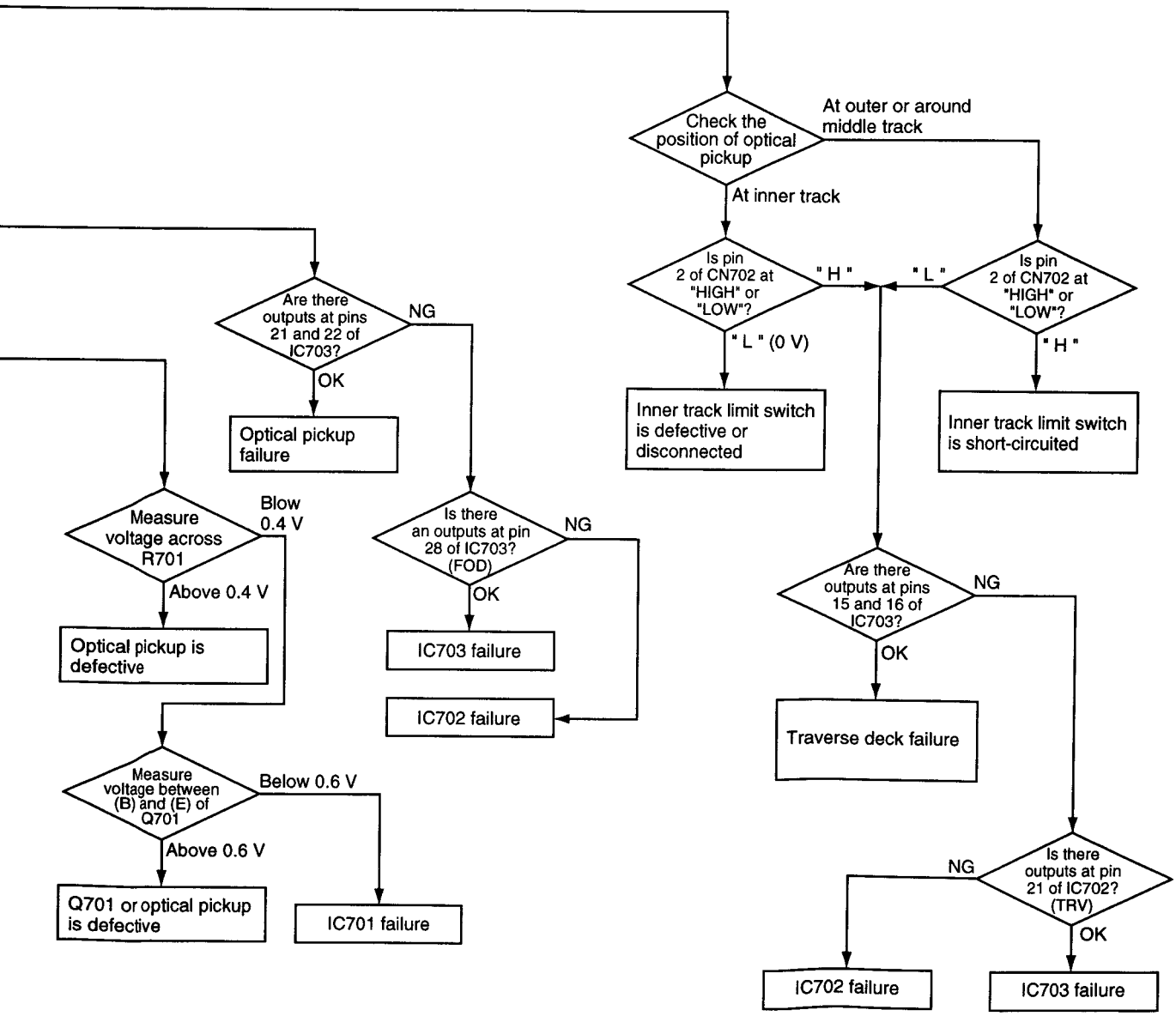
■ Block Diagram




MN662741RPA
IC702
SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/
DIGITAL FILTER/D/A CONVERTER
TOTX178
IC402
BA4558FHTT1
IC405(1/2)
L.P.F.
JK401 (1/2)
Lch OUT
A.GND
A.GND
Rch OUT
OUTL
OUTR
LRCK
SRDATA
BCLK
DSLF
ARF
DSL
PHASE COMPA-RATOR
FREQUENCY COMPARATOR
VCO
SYNCHRO-NIZING PROTECTION
EFM DATA DEMODU-LATOR
SYNDROME CALCU-LATION
CIRC DECODER
INTER-POLATION /SOFT MUTING /DIGITAL ATTENUA-TION
DIGITAL AUDIO INTERFACE
S/P CONVERTER
DIGITAL DE-EMPHASIS
DIGITAL FILTER
MASH LOGIC
PWM LOGIC
SERVO INPUT PORT
A/D CONVERTER
BDO
/RF DET
RF ENV
FE
TE
OFT
TRCRS
VDET
VREF
TBAL
FBAL
SYNCHRONIZING INTERPOLATION PROTECTION
RAM ADDRESS GENERATOR
16K SRAM
CLV SERVO
SERVO CPU
PEAK DETECTOR/ AUTO CUE
SUB-CODE DEMODULATOR
CRCC CHECK
Q-CODE REGISTER
TES
WVEL
PLAY
LDON
D/A CONVERTER
SERVO OUTPUT PORT
TIMING GENERATOR
X701
SMCK
MICROCOMPUTER INTERFACE
DVDD1
AVDD2
AVDD1
VDD
/RST
FOD
TRD
TVD
FCS
KICK
TRV
FCM
PC
SENSE
/FLOCK
/TLOCK
BLKCK
SQCK
SUBQ
SUBC
SBCK
/CLDCK
DMUTE
STAT
MDATA
MCLK
MLD
DVss1
AVss1
AVss2
Vss
X401
TA7291S
IC790
MOTOR DRIVE
LOADING MOTOR
/CLOSE
/OPEN
D801
Q408,409
LED DRIVE
LED STOP
LED PLAY
LC66356B4H02
IC403
SYSTEM CONTROL
SVRST
OSC1
OSC2
STATUS
REST SW
OPEN SW
CLOSE SW
HOLD
TEST
SEL-TU
TEST OUT
S701 (REST)
S790 (OPEN DET.)
S791 (CLOSE DET.)
DTI
DTO
CLK
CS
REQ
Q401,402
SWIT-CHING
Q403
SWIT-CHING
DT
CLK
CS
REQ
T.GND
T.GND
A.GND
Q404
RESET SIGNAL GENERATOR
Q423
POWER SUPPLY
S801~809
KEY MATRIX
VREF GND
KEY CD
D408
D481,482
DC.GND
LM2940T5M
IC401
REGULATOR
Q405,406
REGULATOR
D401,402
AC1
CT
AC2
SEL TU
NOTE :
: CD DIGITAL / ANALOG SIGNAL LINE

■Troubleshooting Guide


No CD playback
Does the test disc rotate?
NO
YES
Remove the test disc
Turn on OPEN/CLOSE switch (S615)
Check if TOC reading is performed
NO
YES
Does optical pickup move?
NO
Optical pickup moves toward inner track once, and then toward outer track slightly (2 or 3 mm).
Does playing time appear on the display?
No access
Playing time appear on the display
Below 700 mV or no output
Check output at TJ701 (RF)
At about 1.0 Vp-p
Are there outputs at pins 1, 2 and 3 of IC702?
NG
① BCLK
② LRCK
③ SRDATA
OK
Is pin 66 of IC702 at "HIGH" or "LOW"? (CLVS)
" L "
" H "
Does lens make vertical movement?
NO
YES
Are there outputs at pins 28 and 30 of CN702?
OK
" H "
Is pin 6 of CN702 at "HIGH" or "LOW"?
" L "
No signal
Is there an output at pin 26 of IC702? (CLVS)
NG
OK
Does laser diode come on?
NO
YES
IC702 failure
Load the test disc
IC702 failure
Check the unit
IC702 failure
R726 failure
Turn on OPEN/CLOSE switch (S615)
Remains at " H "
Check pin 15 of IC701 (/RFDET)
Changes from " H " to " L "
No waveform or upper and lower amplitudes are not equal.
Check pin 23 of IC701 (FE)
Remains at " H "
Check pin 11 of IC702 (/FLOCK)
Changes from " H " to " L "
Optical pickup failure
Upper and lower amplitudes of waveform are eqal.
IC701 failure
IC702 failure
IC703 failure


Check the position of optical pickup
At outer or around middle track
At inner track
Is pin 2 of CN702 at "HIGH" or "LOW"?
" H "
" L "
Is pin 2 of CN702 at "HIGH" or "LOW"?
" L " (0 V)
" H "
Inner track limit switch is defective or disconnected
Inner track limit switch is short-circuited
Are there outputs at pins 21 and 22 of IC703?
NG
OK
Optical pickup failure
Measure voltage across R701
Blow 0.4 V
Above 0.4 V
Optical pickup is defective
Is there an outputs at pin 28 of IC703? (FOD)
NG
OK
IC703 failure
IC702 failure
Measure voltage between (B) and (E) of Q701
Below 0.6 V
Above 0.6 V
Q701 or optical pickup is defective
IC701 failure
Are there outputs at pins 15 and 16 of IC703?
NG
OK
Traverse deck failure
Is there outputs at pin 21 of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure

■ Replacement Parts List (Electrical)

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC401⚠	LM2940T5	IC	[M]
IC402	T0TX178	IC	[M]
IC403	LC66356B4H02	IC	[M]
IC405	BA4558FHTT1	IC	[M]
IC790	TA7291S	IC	[M]
		TRANSISTOR(S)	
Q401	2SC1740SRSTA	TRANSISTOR	[M]
Q402	DTC143ESTP	TRANSISTOR	[M]
Q403	2SC1740SRSTA	TRANSISTOR	[M]
Q404	DTC114YSTP	TRANSISTOR	[M]
Q405, 406⚠	2SD2137PQTA	TRANSISTOR	[M]
Q408, 409	DTA143XSTP	TRANSISTOR	[M]
Q423	2SA933SSTA	TRANSISTOR	[M]
		DIODE(S)	
D401-403⚠	RL1N4003N02	DIODE	[M]
D404⚠	MTZJ8R2BTA	DIODE	[M]
D405, 406	1SS254TA	DIODE	[M]
D408-410	1SS254TA	DIODE	[M]
D481⚠	RL1N4003N02	DIODE	[M]
D482⚠	MTZJ5R1BTA	DIODE	[M]
D801	SPR-305MDTF	DIODE	[M]
		COIL(S)	
L401, 402⚠	BL02RN2R65T2	COIL	[M]
L406	ELEXT101KA9	COIL	[M]
L408	BL02RN2R62T4	COIL	[M]
L409	ELEXT1R0KA9	COIL	[M]
		OSCILLATOR(S)	
X401	EF0EC4234T3	OSCILLATOR	[M]
		SWITCH(ES)	
S790, 791	RSH1A005	SW	[M]
S801-809	EVQ21405R	SW	[M]
		CONNECTOR(S)/JACK(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN401	RJP6G17ZA	CONNECTOR(6P)	[M]
CN402	RJS1A6223-1	CONNECTOR(23P)	[M]
CN403, 404	RJS1A6605	CONNECTOR(5P)	[M]
CN405	RJS1A6606	CONNECTOR(6P)	[M]
CN801	RJU099W10	CONNECTOR(10P)	[M]
CP790	RJP6G17ZA	CONNECTOR(6P)	[M]
CP801	RJT099W10-1	CONNECTOR(10P)	[M]
JK401	RJT065K19	CONNECTOR(19P)	[M]
		GND PLATE	
E401	SNE1004-2	GND PLATE	[M]
		CD SERVO CIRCUIT	
		INTEGRATED CIRCUIT(S)	
IC701	AN8835SBE1	IC	[M]
IC702	MN662741RPA	IC	[M]
IC703	AN8389SE1	IC	[M]
		TRANSISTOR(S)	
Q701	2SB709S	TRANSISTOR	[M]
		COIL(S)	
L701	RLBN102V-Y	COIL	[M]
		OSCILLATOR(S)	
X701	RSXB16M9J02T	OSCILLATOR	[M]
		SWITCH(ES)	
S701	RSM0006-P	SW	[M]
		CONNECTOR(S)	
CN701	RJU035T016-1	CONNECTOR (16P)	[M]
CN702	RJS1A6723-1Q	CONNECTOR (23P)	[M]

■ Resistors and Capacitors

Notes: *Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)
*Resistance values are in ohms, unless specified otherwise, 1K = 1,000 (OHM) 1M = 1,000k (OHM)
*[M] Indicates in Remarks columns parts that are supplied by MESA.

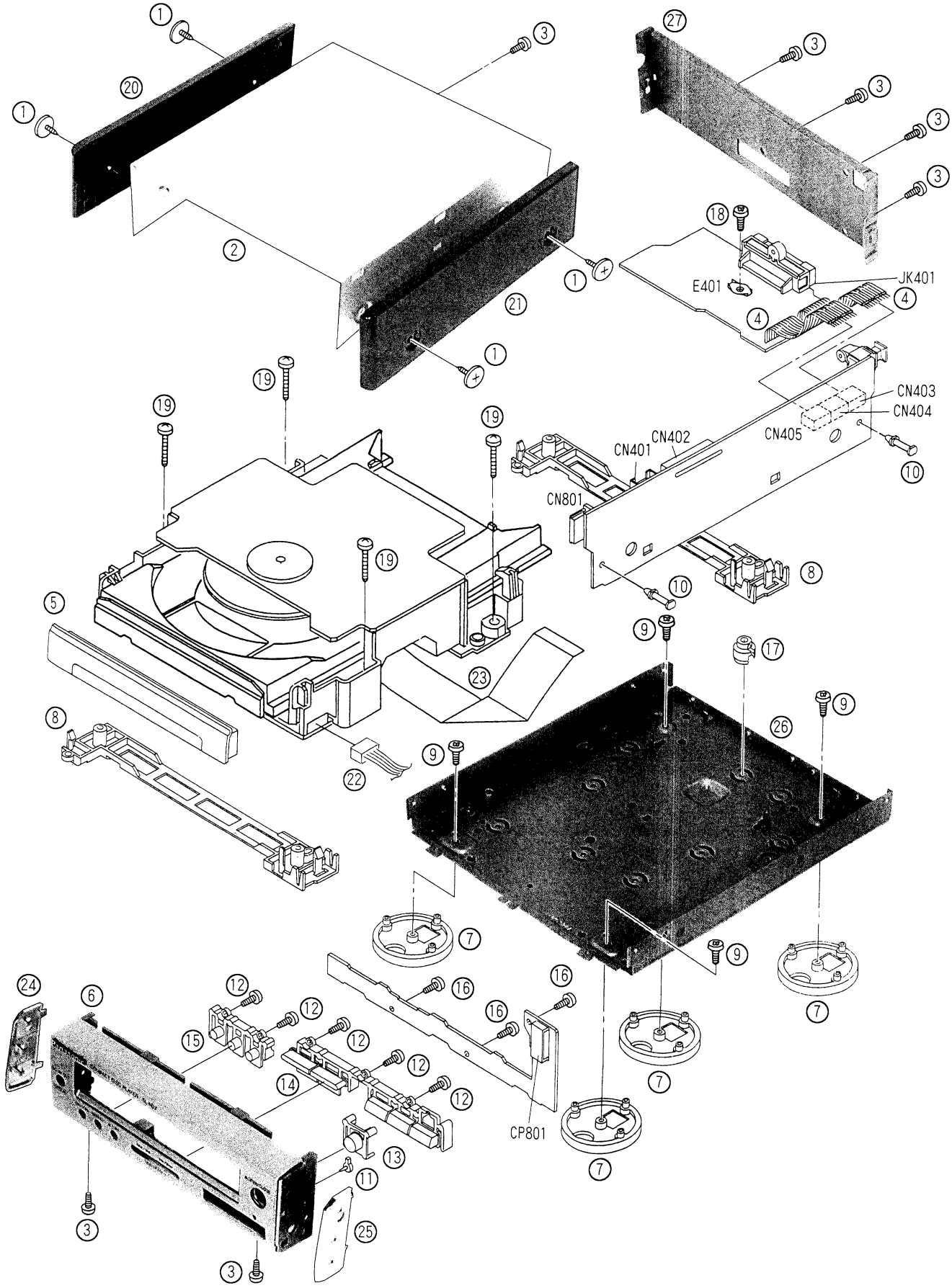
Ref. No.	Part No.	Values & Remarks
		RESISTORS
R403	ERDS2TJ102	1/4W 1K [M]
R405	ERDS2TJ103	1/4W 10K [M]
R406	ERDS2TJ473	1/4W 47K [M]
R407	ERDS2TJ223	1/4W 22K [M]
R409, 410	ERDS2TJ103	1/4W 10K [M]
R411	ERDS2TJ471	1/4W 470 [M]
R412	ERDS2TJ101	1/4W 100 [M]
R413	ERDS2TJ471	1/4W 470 [M]
R414	ERDS2TJ102	1/4W 1K [M]
R415	ERDS2TJ105T	1/4W 1M [M]
R423	ERDS2TJ472	1/4W 4.7K [M]
R427	ERDS2TJ472	1/4W 4.7K [M]
R428	ERDS2TJ103	1/4W 10K [M]
R429	ERDS2TJ471	1/4W 470 [M]
R430	ERDS2TJ104	1/4W 100K [M]
R431-434	ERDS2TJ103	1/4W 10K [M]
R435, 436	ERDS2TJ104	1/4W 100K [M]
R439	ERDS2TJ101	1/4W 100 [M]
R440	ERDS2TJ102	1/4W 1K [M]
R441⚠	ERQ16NKWR15E	1/6W 0.15 [M]
R442⚠	ERDS1FVJ271T	1/2W 270 [M]
R443⚠	ERD2FCJ6R8	1/4W 6.8 [M]
R445, 446	ERDS2TJ1R2	1/4W 1.2 [M]
R455, 456	ERDS2TJ221	1/4W 220 [M]
R457	ERDS2TJ1R2	1/4W 1.2 [M]
R458	ERDS2TJ102	1/4W 1K [M]
R459, 460	ERDS2TJ473	1/4W 47K [M]
R471-474	ERDS2TJ391	1/4W 390 [M]
R475-477	ERDS2TJ103	1/4W 10K [M]
R481, 482	ERDS2TJ271	1/4W 270 [M]
R483, 484	ERDS2TJ102	1/4W 1K [M]
R485, 486	ERDS2TJ104	1/4W 100K [M]
R487-490	ERDS2TJ223	1/4W 22K [M]
R491, 492	ERDS2TJ273	1/4W 27K [M]
R493, 494	ERDS2TJ332	1/4W 3.3K [M]
R495, 496	ERDS2TJ101	1/4W 100 [M]
R497	ERDS2TJ182	1/4W 1.8K [M]
R498	ERDS2TJ272T	1/4W 2.7K [M]
R810	ERDS2TJ821	1/4W 820 [M]
R811	ERDS2TJ102	1/4W 1K [M]
R812	ERDS2TJ122	1/4W 1.2K [M]
R813	ERDS2TJ152	1/4W 1.5K [M]
R814	ERDS2TJ182	1/4W 1.8K [M]
R815	ERDS2TJ222	1/4W 2.2K [M]
R816	ERDS2TJ332	1/4W 3.3K [M]
R817	ERDS2TJ472	1/4W 4.7K [M]

Ref. No.	Part No.	Values & Remarks
		CAPACITORS
C401	ECBT1H102KB5	50V 1000P [M]
C402	ECBT1H104ZF5	50V 0.1U [M]
C405	ECBT1H104ZF5	50V 0.1U [M]
C406	RCE1HKS3R3BV	50V 3.3U [M]
C409	ECBT1E103ZF	25V 0.01U [M]
C410⚠	ECA1EM222B	25V 2200U [M]
C411-413	ECBT1E103ZF	25V 0.01U [M]
C415	ECBT1H330J5	50V 33P [M]
C416	RCE1AKA101BG	10V 100U [M]
C417, 418	ECBT1H102KB5	50V 1000P [M]
C419	ECEA0JKA221B	6.3V 220U [M]
C420	ECEA1AKA221B	10V 220U [M]
C425	ECBT1E103ZF	25V 0.01U [M]
C426	ECBT1H101KB5	50V 100P [M]
C428	ECBT1H102KB5	50V 1000P [M]
C481⚠	ECA1EM101B	25V 100U [M]
C483, 484	ECBT1H102KB5	50V 1000P [M]
C485, 486	ECBT1H331KB5	50V 330P [M]
C487, 488	ECBT1H121KB5	50V 120P [M]
C489, 490	ECEA0JKS220B	6.3V 22U [M]
C491, 492	ECEA1AKA220B	10V 22U [M]
C493, 494	ECBT1H101KB5	50V 100P [M]
C790	ECA1AKF820E	10V 82U [M]
C801	ECBT1H102KB5	50V 1000P [M]
		CD SERVO CIRCUIT
		RESISTORS
R701	ERJ6GEYJ4R7V	1/10W 4.7 [M]
R703	ERJ6GEYJ823	1/10W 82K [M]
R704	ERJ6GEYJ102A	1/10W 1K [M]
R705	ERJ6GEYJ103V	1/10W 10K [M]
R706	ERJ6GEYJ102A	1/10W 1K [M]
R707	ERJ6GEYJ474V	1/10W 470K [M]
R708	ERJ6GEYJ154V	1/10W 150K [M]
R709	ERJ6GEYJ683V	1/10W 68K [M]
R711	ERJ6GEYJ154V	1/10W 150K [M]
R712	ERJ6GEYJ221V	1/10W 220 [M]
R714	ERJ6GEYJ121V	1/10W 120 [M]
R717, 718	ERJ6GEYJ102A	1/10W 1K [M]
R720	ERJ6GEY0R00A	1/10W 0.00 [M]
R721	ERJ6GEYJ101V	1/10W 100 [M]
R722	ERJ6GEYJ563V	1/10W 56K [M]
R723	ERJ6GEYJ182V	1/10W 1.8K [M]
R724	ERJ6GEYJ333V	1/10W 33K [M]
R725	ERJ6GEYJ472V	1/10W 4.7K [M]

Ref. No.	Part No.	Values & Remarks
R726	ERJ6GEYJ473V	1/10W 47K [M]
R727	ERJ6GEYJ822V	1/10W 8.2K [M]
R728	ERJ6GEYJ103V	1/10W 10K [M]
R731	ERJ6GEYJ822V	1/10W 8.2K [M]
R735, 736	ERJ6GEYJ101V	1/10W 100 [M]
R744	ERJ6GEYJ103V	1/10W 10K [M]
R745	ERJ6GEYJ155V	1/10W 1.5M [M]
R748	ERJ6GEYJ182V	1/10W 1.8K [M]
R749	ERJ6GEYJ682V	1/10W 6.8K [M]
R750, 751	ERJ6GEYJ473V	1/10W 47K [M]
R752	ERJ8GEYJ220V	1/8W 22 [M]
R770, 771	ERJ6GEYJ155V	1/10W 1.5M [M]
R772	ERJ6GEYJ273V	1/10W 27K [M]
RJ701-709	ERJ8GEY0R00A	1/8W 0.00 [M]
RJ714-717	ERJ8GEY0R00A	1/8W 0.00 [M]
RJ721-724	ERJ6GEY0R00A	1/10W 0.00 [M]
RJ726-731	ERJ6GEY0R00A	1/10W 0.00 [M]
		TEST JUMPER
TJ701, 702	EYF8CU	[M]
		CAPACITORS
C1	ECUV1E473ZFV	25V 0.047U [M]
C2, 3	ECUVNE104KBN	0.1U [M]
C4, 5	ECUV1H681KBV	50V 680P [M]
C701	ECEA0JKA330I	6.3V 33U [M]
C702	ECUZNE104MBN	25V 0.1U [M]
C703	ECEA0JKA101I	6.3V 100U [M]
C704, 705	ECUZNE104MBN	25V 0.1U [M]
C706	ECUV1H272KBN	50V 2700P [M]
C707	ECUV1E273KBN	25V 0.027U [M]
C708	ECUE1H472KBN	50V 4700P [M]
C709	ECUE1C473KBN	16V 0.047U [M]
C710	ECUV1H182KBN	50V 1800P [M]
C711, 712	ECUWNE104ZFN	25V 0.1U [M]
C713	ECUV1C104MBM	16V 0.1U [M]
C714	ECEA0JKA101I	6.3V 100U [M]
C716	ECUE1H561KBN	50V 560P [M]
C717	ECUWNE104ZFN	25V 0.1U [M]
C718	ECUVNC224KBN	16V 0.22U [M]
C721, 722	ECUV1H100DCN	50V 10P [M]
C723	ECEA1AKA221I	10V 220U [M]
C724	ECUV1C104MBM	16V 0.1U [M]
C725, 726	ECUE1H102KBN	50V 1000P [M]
C727, 728	ECEA1HPK010I	50V 1U [M]
C730	ECUWNE104ZFN	25V 0.1U [M]
C731, 732	ECEA0JKA221I	6.3V 220U [M]

Ref. No.	Part No.	Values & Remarks
C733	ECUZNE104MBN	25V 220U [M]
C734	ECEA1AKA221I	10V 220U [M]
C735-737	ECUWNE104ZFN	25V 0.1U [M]
C738	ECUV1C154KBN	16V 0.15U [M]
C742	ECUV1E273KBN	25V 0.027U [M]
C743	ECUWNE104ZFN	25V 0.1U [M]
C744	ECUE1E822KBN	25V 8200P [M]
C745	ECUE1H102KBN	50V 1000P [M]
C747	ECUE1H222KBN	50V 2200P [M]
C748	ECUV1H471KBM	50V 470P [M]
C749	ECUZNE104MBN	25V 0.1U [M]
C750	ECUV1C104MBM	16V 0.1U [M]
C751	ECUZNE104MBN	50V 0.1U [M]
C752	ECUE1H152KBN	50V 1500P [M]
C753	ECUV1H471KBM	50V 470P [M]
C754	ECUE1H471KBN	50V 470P [M]

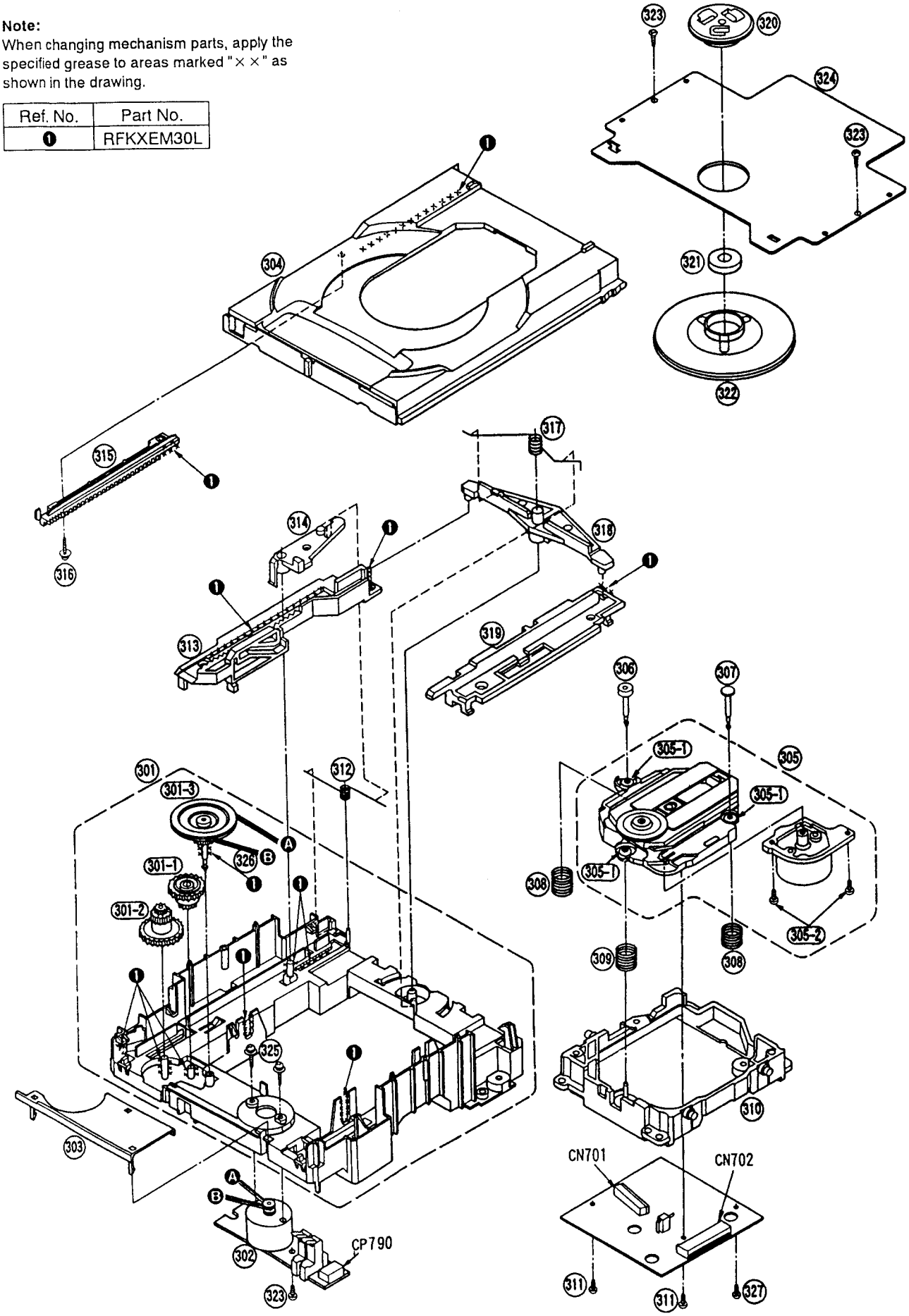
■ Cabinet Parts Location



■ Loading Mechanism Parts Location

Note:
When changing mechanism parts, apply the specified grease to areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❶	RFKXEM30L



■ Replacement Parts List (Cabinet, Loading Mechanism and Jig/Tool)

Note: The reference number SA represent the grease and tool used for this unit.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PART(S)	
1	RHD30073-K	SCREW	[M]
2	RKMD327-S	CABINET	[M]
3	XTBS3+8JFZ1	SCREW	[M]
4	REZ0888	WIRE ASS'Y	[M]
5	RFKNLHD7MDAN	TRAY ORNAMENT ASS'Y	[M]
6	RFKGLHD50EN	FRONT PANEL ASS'Y	[M]
7	RKA0076-N	FOOT	[M]
8	RMN0382	SPACER	[M]
9	XTB3+6G	SCREW	[M]
10	RMR0502	SPACER	[M]
11	RGL0335-1Q	LENS	[M]
12	XQN26+AJ6FZ	SCREW	[M]
13	RFKNLHD7NB	BUTTON, OPEN/CLOSE	[M]
14	RFKNLHD7NC	BUTTON, PLAY/STOP	[M]
15	RFKNLHD7ND	BUTTON, RDM/REP/REC	[M]
16	XTBS26+8J	SCREW	[M]
17	SHE170-2	SPACER	[M]
18	XTB3+12JFZ	SCREW	[M]
19	XTB3+18JFZ	SCREW	[M]
20	RGKD817-M	ORNAMENT 2-(L)	[M]
21	RGKD818-M	ORNAMENT 2-(R)	[M]
22	REXD844	WIRE ASS'Y	[M]
23	REZ0887	FFC	[M]
24	RGKD819-N	ORNAMENT 1-(L)	[M]
25	RGKD820-N	ORNAMENT 1-(R)	[M]
26	RMKD324A	CHASSIS	[M]
27	RGR0243A-E	REAR PANEL	[M]
		LOADING MECHANISM	
301	RFKJXDT07-K	ROADING CHASSIS ASS'YL	[M]
301-1	RDG0142	GEAR	[M]
301-2	RDG0193	GEAR	[M]
301-3	RDP0065	PULLEY	[M]
302	REMD019	LOADING MOTOR ASS'Y	[M]
303	RMKD255	BELT COVER	[M]
304	RGQD144-K	DISC TRAY	[M]
305⚠	RAE0150Z	TRAVERSE DECK	[M]
305-1	SHGD113-1	RUBBER	[M]
305-2	SNSD38	SCREW	[M]
306	RMSD350	PIN (A)	[M]
307	RMSD123-1	PIN (B)	[M]
308	RME0109	SPRING (A)	[M]
309	RME0142	SPRING (B)	[M]
310	RMR0698-K	TRAVERSE CHASSIS	[M]
311	XTV2+6G	SCREW	[M]
312	RME0063	SPRING	[M]
313	RMMD079-1	SLIDE PLATE	[M]
314	RML0178-1	LEVER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
315	RFKNLPG440-K	GEAR ASS'Y	[M]
316	RHD20009-1	SCREW	[M]
317	RME0087	SPRING	[M]
318	RML0349	LEVER	[M]
319	RMMD059-1	SLIDE PLATE	[M]
320	RMR0334	HOLDER	[M]
321	RHM245ZA	MAGNET	[M]
322	RXQ0380	MAGNET HOLDER	[M]
323	XTN26+6G	SCREW	[M]
324	RMAD793-1	CLAMPER	[M]
325	XYN2+F6FZ	SCREW	[M]
326	RMG0158	BELT	[M]
327	XTN2+6G	SCREW	[M]
		JIG/TOOL	
		TEST DISC	
SA1	SZZP1054C	TEST DISC	[M]
		GREASE	
SA2	RFKXEM30L	GREASE	[M]

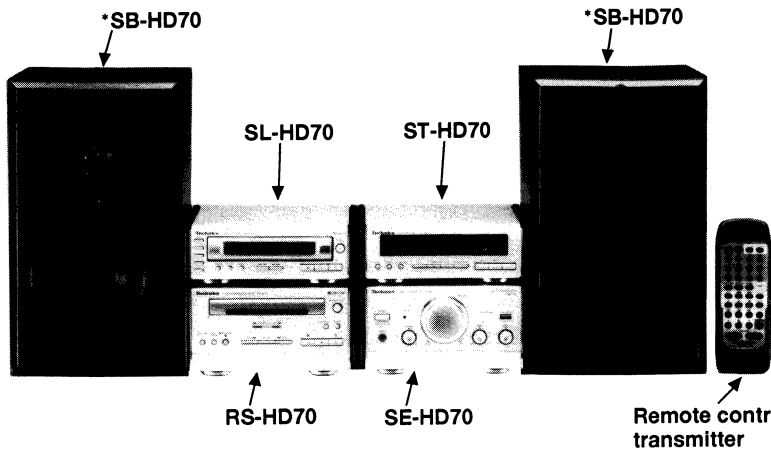
Printed in Japan
F970207500KH/HY

ORDER NO. AD9611201A2

Service Manual

Cassette deck

DOLBY B NR*



Cassette deck

RS-HD70

Colour

(N) ..... Gold Type

Area

E ..... Europe.

System: SC-HD70

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

Please file and use this manual together with the service manual for Model No. RS-CA01, Order No. AD9603073C2.

Notes:
- This simplified service manual is provided to indicate the main differences between the original model No. RS-CA01(E) and the subsequent model No. RS-HD70 (E).
- Refer to the packaging of this service manual.

CHANGES

■Specifications (RS-CA01 Service Manual of cover page.)

RS-CA01(E)

■General

Dimensions (W×H×D)	186x103x246 mm
Weight	1.6 kg

RS-HD70 (E)

■General

Dimensions (W×H×D)	196x103x221 mm
Weight	1.8 kg

System	Tuner	CD Changer	Amplifier	Cassette deck	Speakers
SC-HD70	ST-HD70	SL-HD70	SE-HD70	**RS-HD70**	*SB-HD70

*Made in PAES

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

© 1996 Matsushita Electric Industrial Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

■Change in Replacement Parts List (RS-CA01 Service Manual of pages 28,32,34.)

Notes: • Mentioned in this parts list is only those different from Model No. RS-CA01 (E).
All other parts are the same as for RS-CA01 (E).
• [M] indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Change of Part No. RS-CA01 (E) ➡ RS-HD70 (E)		Part Name & Description		Remarks
TRANSISTOR(S)					
Q201,202	2SJ163PQRTX	**2SJ106GBT85L**	TRANSISTOR		[M]
Q604	2SD2137PQTA	—	TRANSISTOR		[M]Deletion
Q607	2SD2137PQTA	—	TRANSISTOR		[M]Deletion
DIODE(S)					
D709	—	**MA110TX**	DIODE		[M]Addition
RESISTORS					
R241,242	—	**ERJ6GEYJ822V**	1/10W	8.2kΩ	[M]Addition
R611	ERJ6GEYJ1R0V	—	1/10W	1.0Ω	[M]Deletion
R626	ERJ6GEYJ1R0V	—	1/10W	1.0Ω	[M]Deletion
R707	—	**ERJ6GEYJ472V**	1/10W	4.7kΩ	[M]Addition
R728	ERJ6GEYJ472V	**ERJ6GEYJ103V**	1/10W	10kΩ	[M]
R741	ERJ6GEYJ123V	**ERJ6GEYJ223V**	1/10W	22kΩ	[M]
R743	ERJ6GEYJ102V	**ERJ6GEYJ473V**	1/10W	47kΩ	[M]
CABINET AND CHASSIS					
1	RHD30007-S	**RHD30073-K**	SCREW		[M]
2	RKM0326B-S	**RKM0326-S**	CABINET		[M]
4	RGK0812-S	**RGK0810-N**	SIDE ORNAMENT (L)		[M]
5	RGK0813-S	**RGK0811-N**	SIDE ORNAMENT (R)		[M]
6	RGR0240A-C	**RGR0240A-D**	REAR PANEL		[M]
9	RMK0324	**RMK0324-1**	BOTTOM CHASSIS		[M]
11	RFKGSCA01E-N	**RFKGSHD70E-N**	FRONT PANEL ASS'Y		[M]
13	RGL0331-Q2	**RGL0331-Q**	PANEL LIGHT (A)		[M]
14	RGL0332-Q1	**RGL0332-Q**	PANEL LIGHT (B)		[M]
22	—	**XTBS3+10JFZ1**	SCREW		[M] Addition
23	—	**RGK0808-M**	SIDE PANEL (L)		[M] Addition
24	—	**RGK0809-M**	SIDE PANEL (R)		[M] Addition
PACKING MATERIAL					
P1	—	**RPG3174**	PACKING CASE		[M] Addition
P2	—	**RPN1008**	CUSHION		[M] Addition
P3	—	**SPP740**	PROTECTION BAG (UNIT)		[M] Addition
P4	—	**RPQ0745**	SPACER		[M] Addition

■Schematic Diagram

● This schematic diagram may be modified at any time with development of new technology.

Page

A MAIN CIRCUIT ..... 4~7

B MECHANISM CIRCUIT 5

C OPERATION CIRCUIT 7

Notes:

- **S803**: Cassette holder open detection switch in "off" position.
- **S804**: Cassette holder close detection switch in "off" position.
- **S900**: Stop (■) switch.
- **S901**: Dolby noise-reduction switch (DOLBY NR).
- **S902**: Rewind tape program sensor switch (◀◀ [TPS]).
- **S903**: Reverse-side playback switch (◀).
- **S904**: TPS skip switch (TPS SKIP).
- **S905**: Forward-side playback switch (▶).
- **S906**: Fast forward tape program sensor switch (▶▶ [TPS]).
- **S909**: Rec pause switch (● REC PAUSE).
- **S910**: Cassette holder open/ close switch (▲ OPEN/ CLOSE).
- **S911**: Counter display switch (DISPLAY).
- **S912**: Counter reset switch (RESET).
- **S915**: Reverse-mode select switch (REV. MODE).
- **S971**: Mode switch in "off" position.
- **S972**: Half switch in "off" position.
- **S973**: ATS (CrO_2) switch in "off" position.
- **S974**: Reverse rec. inhibit switch in "off" position.
- **S975**: Forward rec. inhibit switch in "off" position.
- **S976**: ATS (Metal) switch in "off" position.

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K=1,000 (Ω), 1M=1,000 (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( )..... Voltage values at record mode.
  For measurement us EVM.
- Voltage values and waveforms are measured as indicated in the schematic diagram when test points between TP604 and TP605, and between A. GND and TP602 are shorted.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
- ▬▶▬ : Positive voltage line
  ▬▶ : Negative voltage line
  ▬▶ : Playback signal line
  ⇨ : Recording signal line

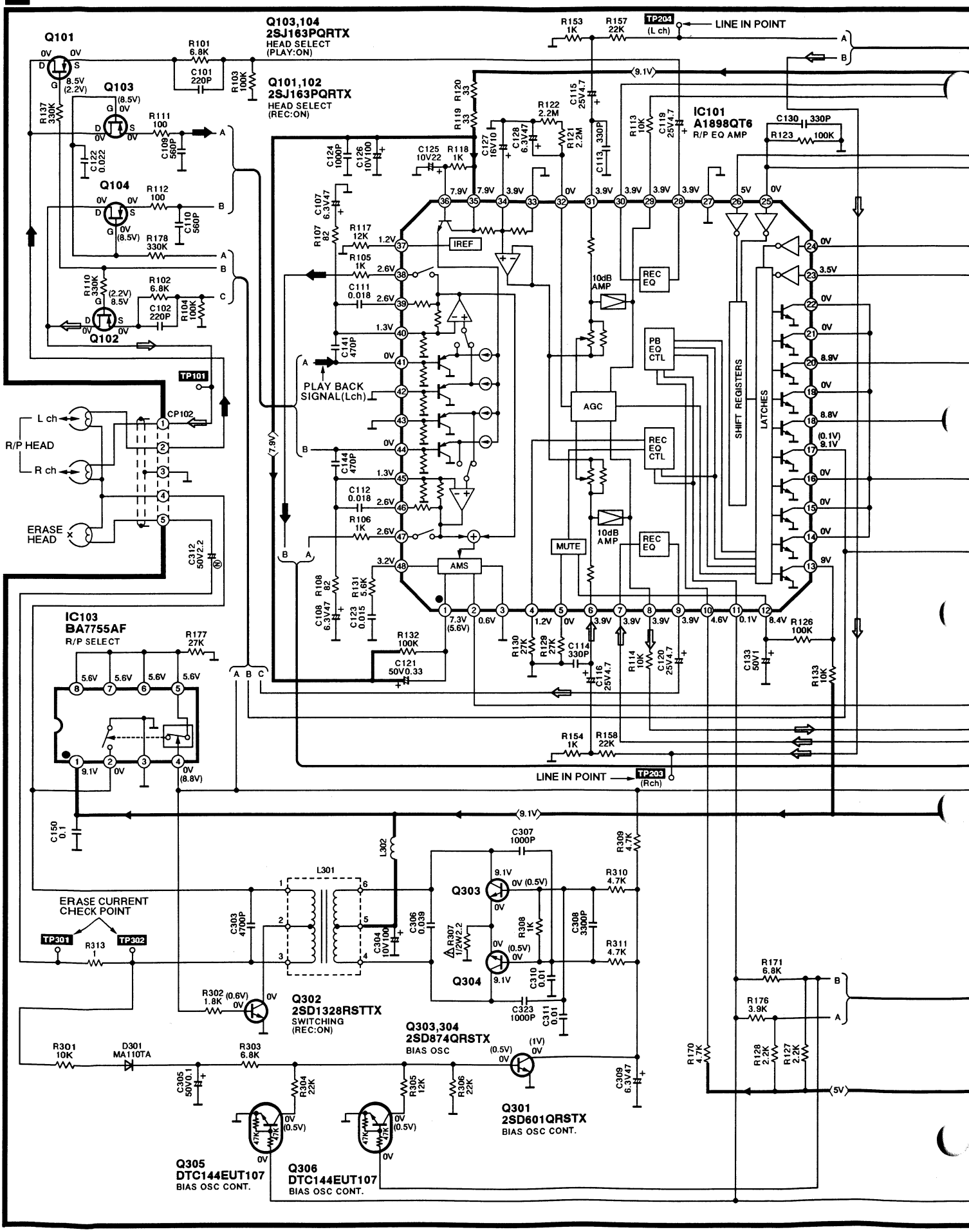
● Caution!

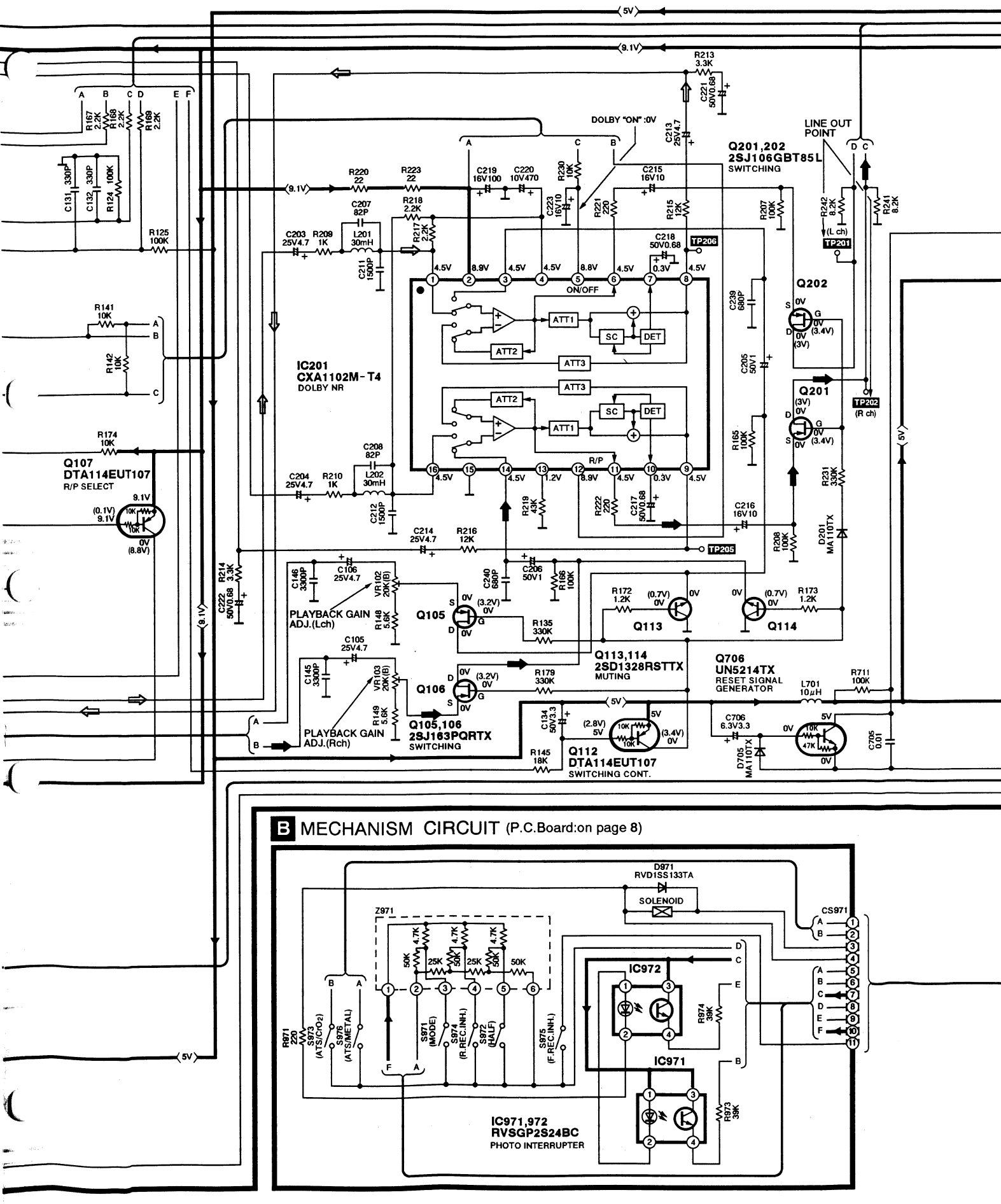
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

• ➡ : Playback signal line • ⇨ : Recording signal line

A MAIN CIRCUIT (P.C.Board:on page 9)

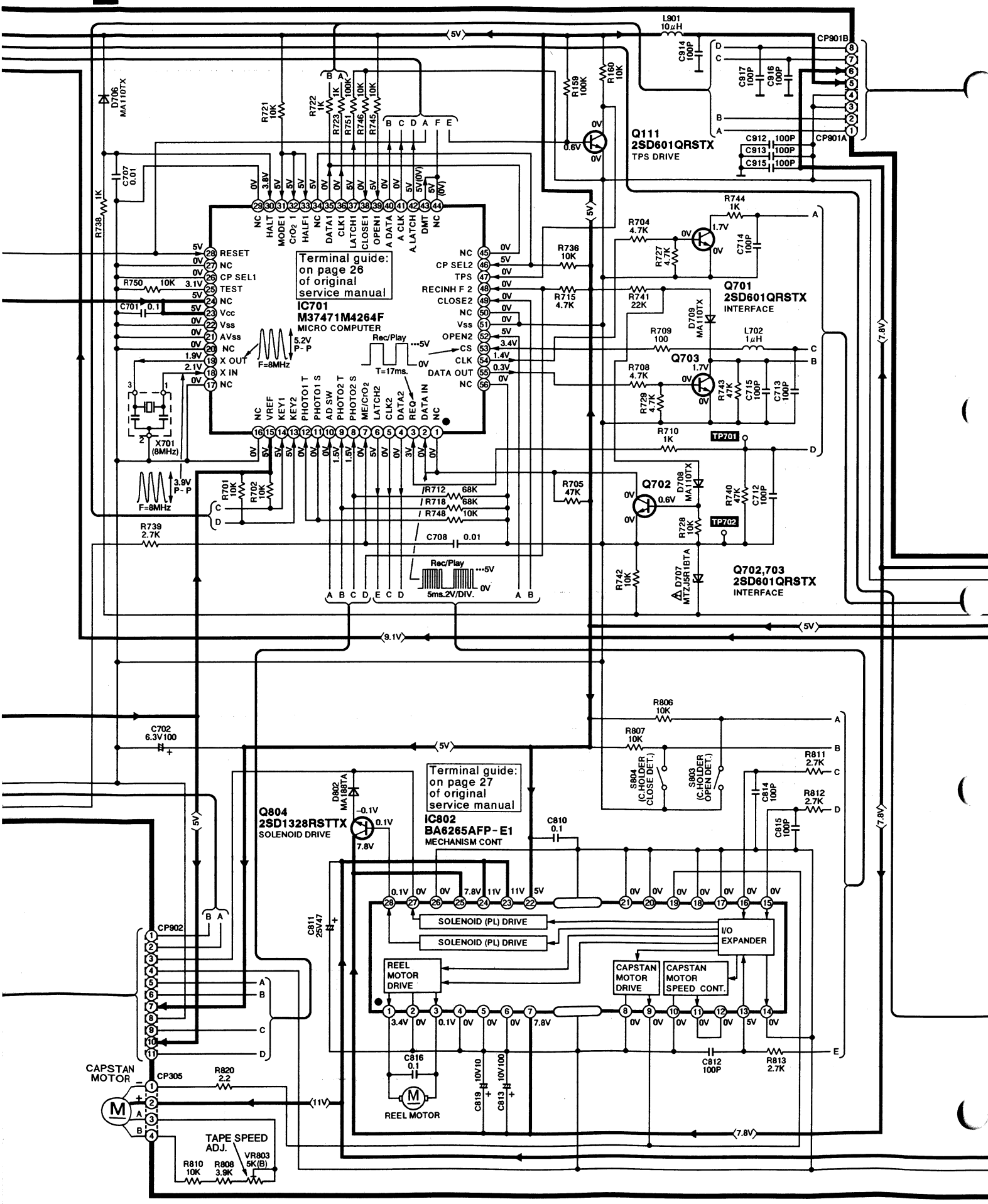




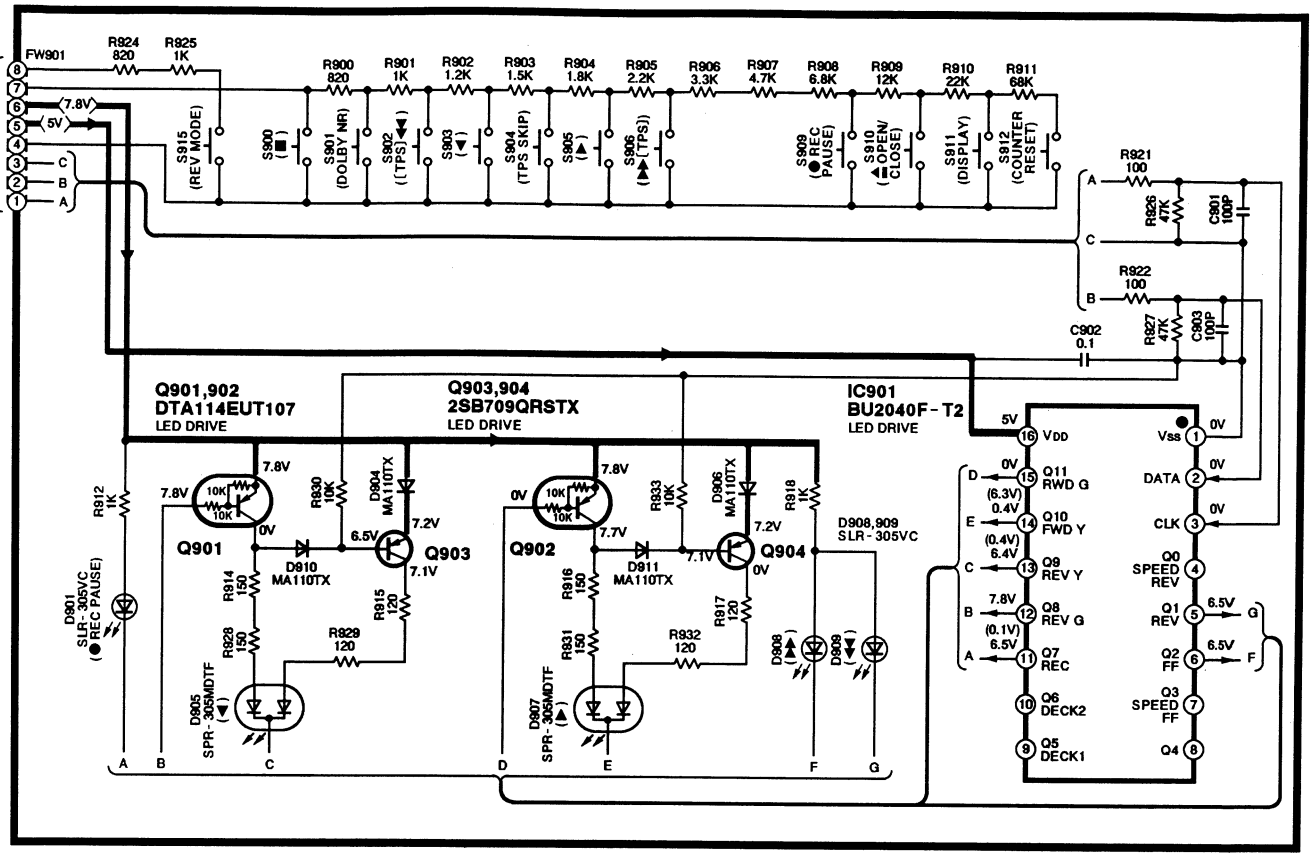
B MECHANISM CIRCUIT (P.C.Board:on page 8)

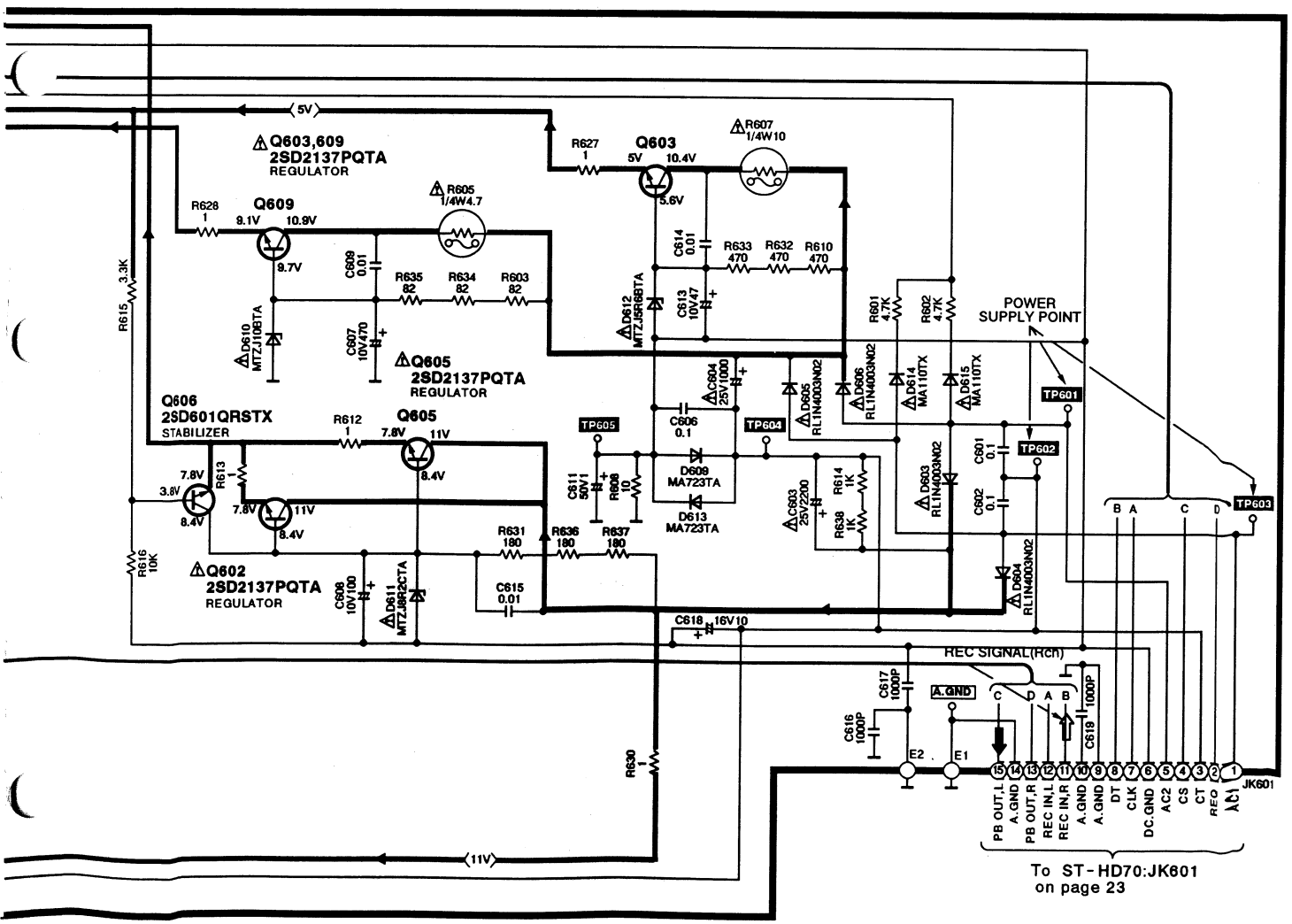
• ➡ : Playback signal line • ⇨ : Recording signal line

A MAIN CIRCUIT (P.C.Board:on page 9)



C OPERATION CIRCUIT (P.C.Board:on page 8)



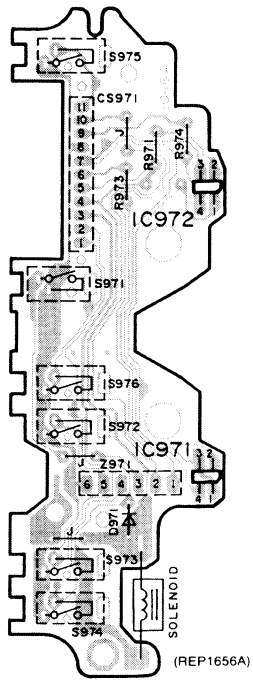


To ST-HD70:JK601 on page 23

■Printed Circuit Board Diagram

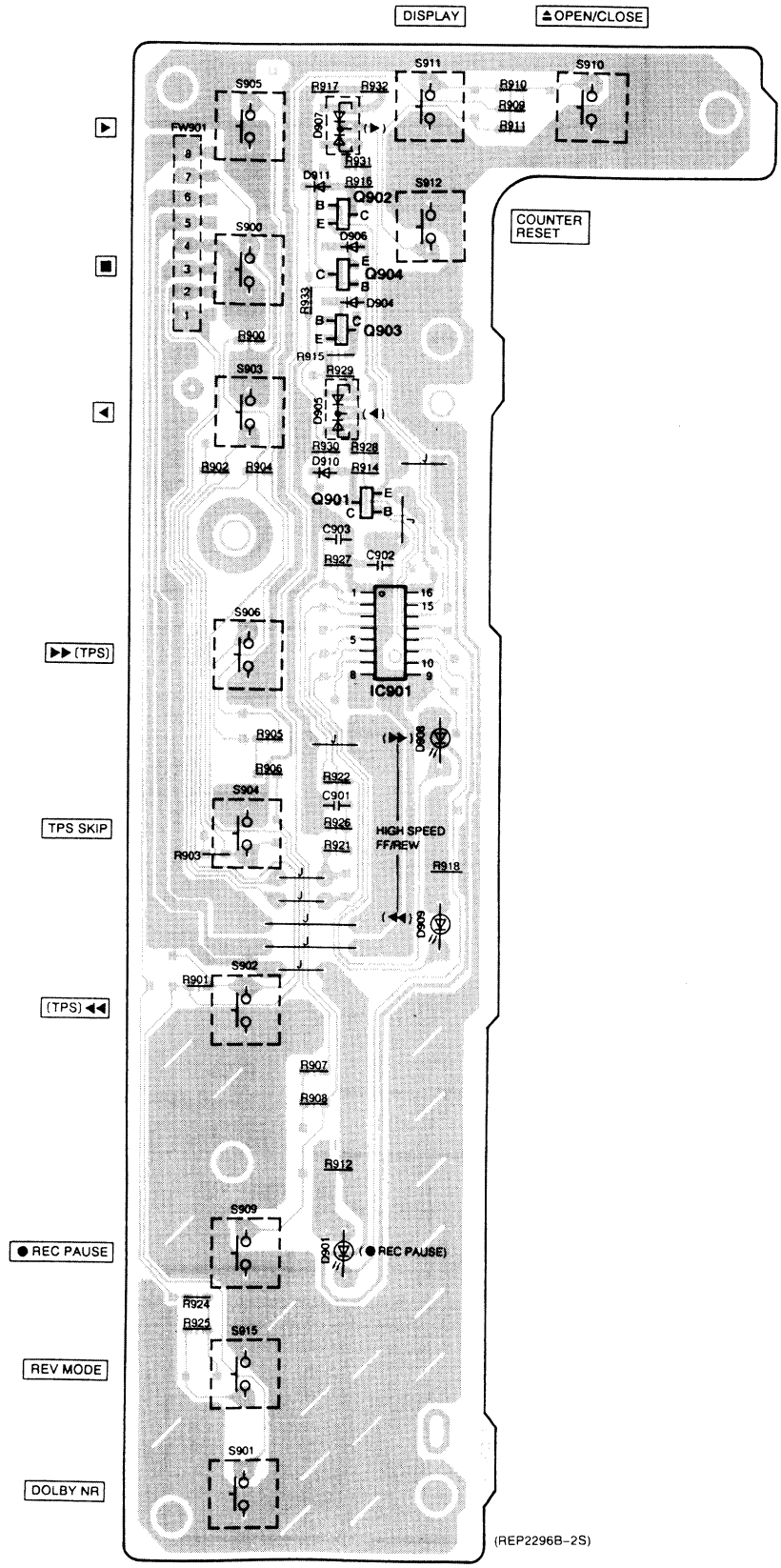
(This schematic diagram may be modified at any time with the development of new technology.)

B MECHANISM P.C.B.



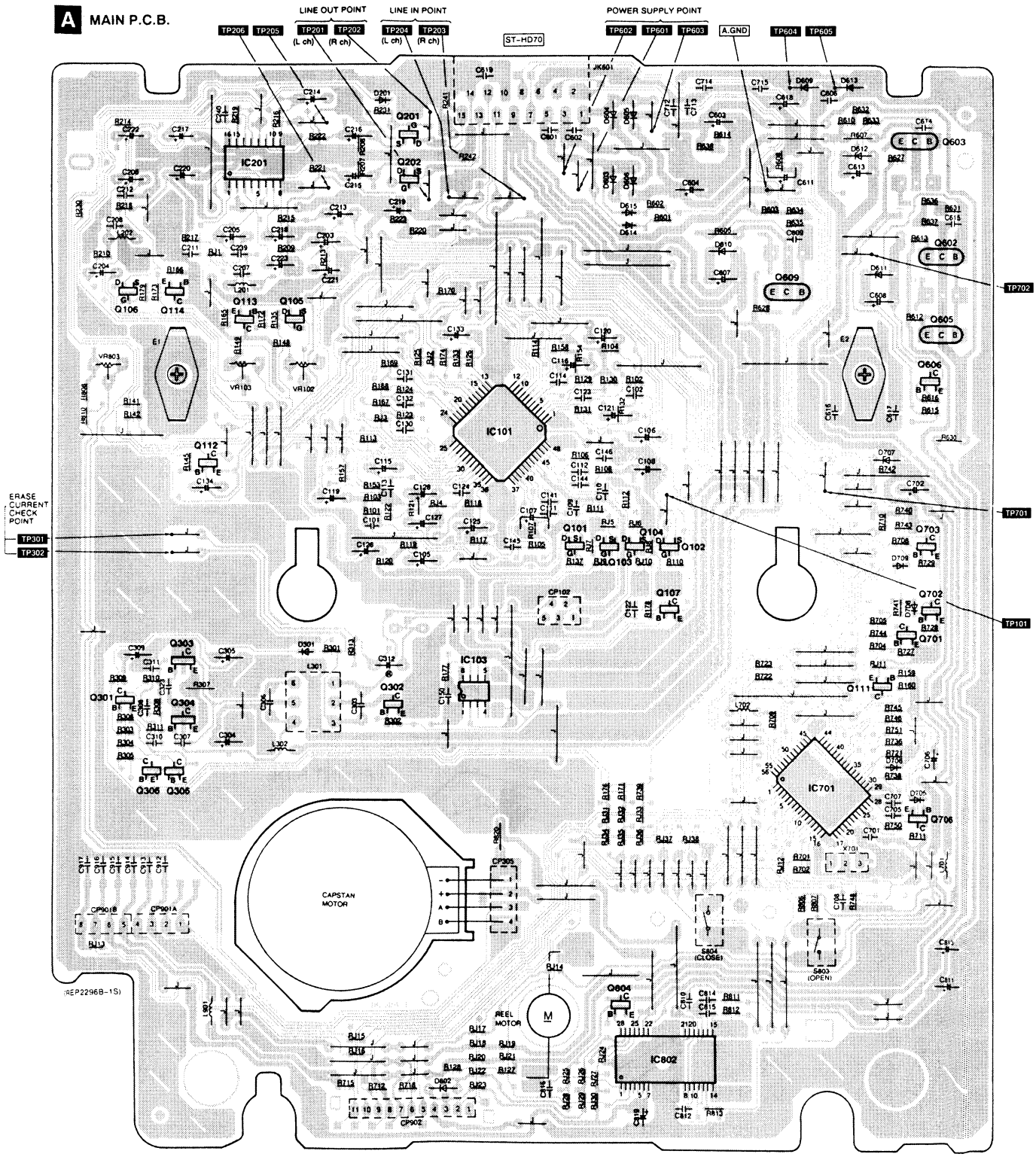
(REP1656A)

C OPERATION P.C.B.

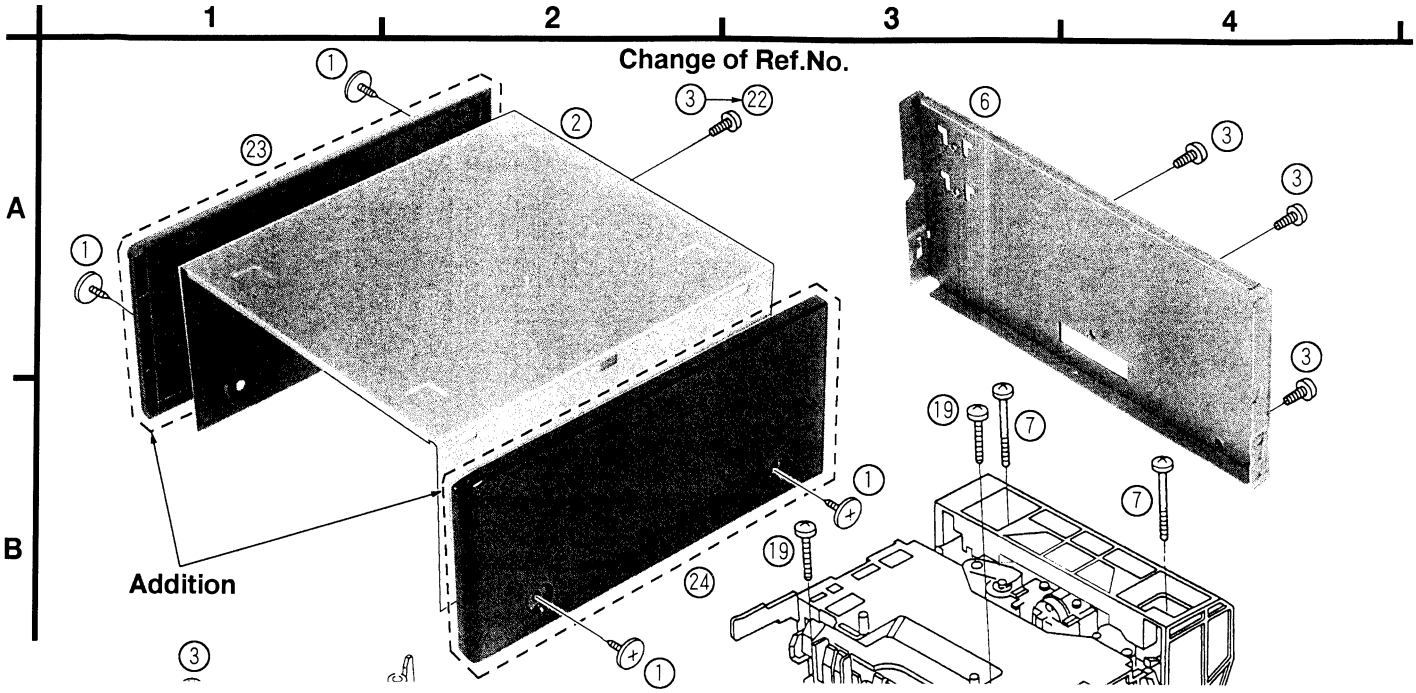


(REP2296B-2S)

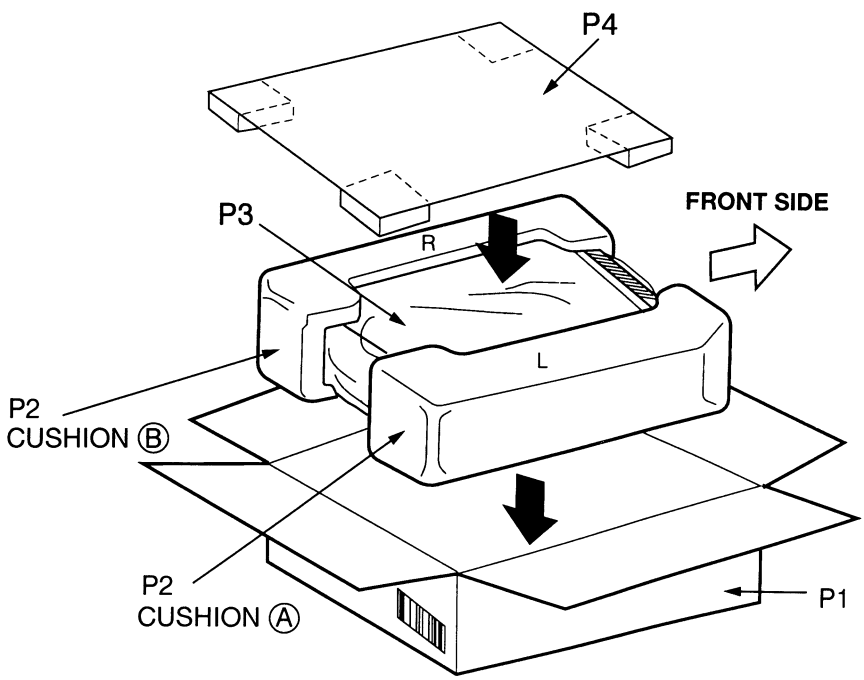
6 7 8 9 10


A MAIN P.C.B.
LINE OUT POINT
LINE IN POINT
POWER SUPPLY POINT
TP206
TP205
TP201 (L ch)
TP202 (R ch)
TP204 (L ch)
TP203 (R ch)
ST-HD70
TP602
TP601
TP603
A.GND
TP604
TP605
JK601
IC201
IC101
IC103
IC701
IC802
Q201
Q202
Q603
Q602
Q609
Q605
Q606
Q106
Q114
Q113
Q105
Q112
Q101
Q104
Q102
Q103
Q107
Q303
Q301
Q302
Q304
Q306
Q305
Q702
Q701
Q703
Q111
Q706
Q804
TP702
TP701
TP101
ERASE CURRENT CHECK POINT
TP301
TP302
CAPSTAN MOTOR
REEL MOTOR
S804 (CLOSE)
S803 (OPEN)
(REP2296B-1S)

■Cabinet Parts Location (RS-CA01 Service Manual of pages 29.)



■Packaging



(CUSHION Ⓐ,Ⓑ : RPN1008)

Printed in Japan
H961107500 TN/HH

ORDER NO. AD9702015C2

Service Manual

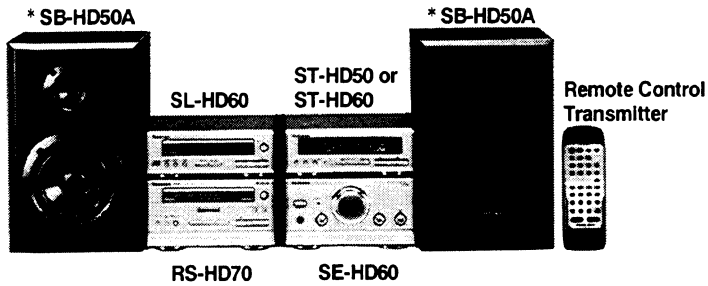
Tuner

PANA -08950

Tuner

System: SC-HD50

ST-HD50



Colour
(N) ..... Gold

Area
(E) ..... Europe.

*

System	Areas	Tuner
SC-HD50	(Germany. Italy.) :	ST-HD60
SC-HD50	(Europe. Russia.) :	ST-HD50

Because of unique interconnecting cables, when a compact requires service, send or bring in the entire system.

Specifications

Pre-amplifier Section

Input sensitivity/impedance
EXTERNAL: 250 mV/15 kohm
Output level
EXTERNAL: 250 mV/1.5 kohm
Frequency response
EXTERNAL: 50 Hz – 25 kHz
S/N
EXTERNAL: DIN 82 dB (83 dB, IHF)

FM tuner Section

Frequency range: 87.50 – 108.00 MHz (0.05 MHz steps)
Sensitivity: 1.8 μV (IHF usable)
S/N 26 dB: 1.5 μV
S/N
MONO: 70dB (75 dB, IHF)
Stereo separation
1 kHz: 35 dB
Antenna terminal(s): 75 ohm (unbalanced)

AM tuner Section

Frequency range: 522 – 1611 kHz (9 kHz steps)
530 – 1620 kHz (10 kHz steps)
Sensitivity (S/N 20 dB): 500 μV/m
MAIN: 80 dB

Timer Section

Clock: Quartz-lock type
Function: 24-hour programmable;
Play timer (1 time), Rec timer (1 time)
Sleep (120 min., 30 min., intervals)
Setting: 1 minute – 23 hours 59 minutes (1 min. intervals)

General

Dimensions: 196(W)/67(H)/235(D) mm
Weight: 1.2 kg

Notes:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

System/SC-HD50:
Tuner: ST-HD50 or ST-HD60, Compact Disc Player: SL-HD60, Amplifier: SE-HD50, Cassette Deck: RS-HD70, Speakers: SB-HD50A

Notes: * ..... Made in PAES

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

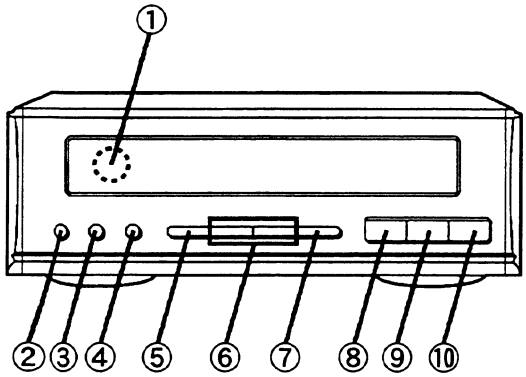
© 1997 Matsushita Electric Industrial Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

■ Contents

	Page
Location of Controls	2
Setting the Time	2
About the Self-Diagnostic Mode	3
Operation Checks and Main Component Replacement Procedures	4,5
Type Illustration of ICs, Transistors and Diodes	5
To Supply Power Source	6
Schematic Diagram	7 ~ 14
Printed Circuit Board Diagram	15 ~ 17
Wiring Connection Diagram	18
Terminal Function of IC's	19
Block Diagram	20 ~ 22
Replacement Parts List (Electrical)	23, 24
Resistors and Capacitors	25, 26
Replacement Parts List (Cabinet, Packing)	27
Cabinet Parts Location	28

NOTE:
Refer to the service manual for Model No. SE-HD50 (ORDER No. AD9702022C3) for information on "Accessories", "Installation", "Connections" and "Packaging".

■ Location of Controls



① Remote control signal sensor (SENSOR)
② Record timer button (◴ REC)
③ Play timer button (◴ PLAY)
④ Clock/timer buttons (CLOCK/TIMER)
⑤ Set button (SET)
⑥ Tuning/time adjust button (∨ , ∧ TUNING/TIME ADJUST)
⑦ Tuning mode select button (TUNING MODE)
⑧ Source input select button (INPUT SELECTOR)
⑨ RDS display mode select button (RDS DISPLAY MODE)
⑩ Band select button (FM/AM)

■ Setting the Time

The tuner display the time, frequency and other information on CDs and tapes.

This is a 24-hour display clock.

These instructions explain how to set the timer for 16:25 on Wednesday.

1 Switch on the power.

2 ① Press CLOCK/TIMER to show "CLOCK".

Every time you press the button, the indication changes in the order of CLOCK → ◴ REC → ◴ PLAY → Original display.

Within 8 seconds:

② Press SET.

3 ① Press ∨ or ∧ to select the day.

Every time you press one of the button, the indication changes in the order of SUN ⇄ MON ⇄ TUE ⇄ WED ⇄ THU ⇄ FRI ⇄ SAT.

② Press SET.

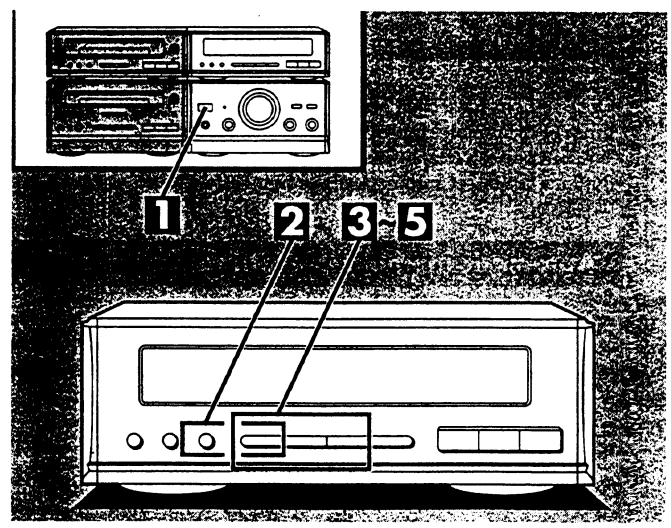
4 ① Press ∨ or ∧ to select the hour.

② Press SET.

5 ① Press ∨ or ∧ to select the minutes.

② Press SET to finish setting the time.

The display will return to the previous display after about 3 seconds.



When " - - : - - " appears:
If flashes when you connect the AC power supply cord for the first time or if there has been a power failure.
Reset the time as explained above.

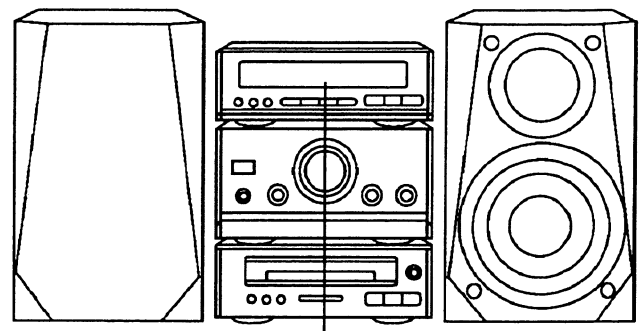
If the minutes setting is off:
1. Press CLOCK/TIMER.
2. Press SET 3 times.
3. Press ∨ or ∧ to set the minutes, and then press SET.

To display the clock again:
Press CLOCK/TIMER.
The clock display will appear for about 8 seconds.

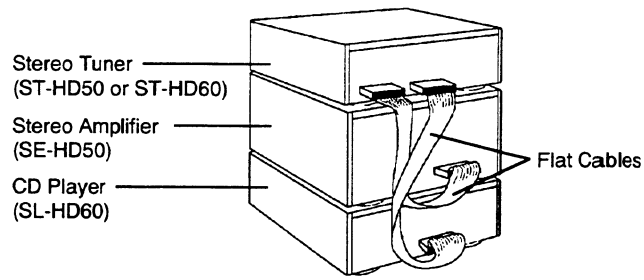
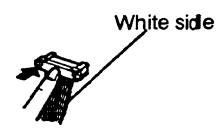
For your reference:
When you turn OFF the system from the POWER button, the system goes on standby and the STANDBY indicator lights up.

■About the Self-Diagnostic Mode

This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically displays a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

Display method	Display location
To display the malfunction code U70 CD ..... Automatically displays on the stereo tuner processor when a malfunction occurs. ＊Good-bye＊ ..... Automatically displays on the stereo tuner processor when a malfunction occurs. **To return to the normal display** **1. For U70 CD:** ● Press an any operation button on the stereo tuner. ● To re-display the code, switch the power off (POWER STANDBY button), and then switch power back on again. **2. For ＊Good-bye＊:** ● If "＊Good-bye＊" is displayed, the power will automatically be switched off and the standby indicator will light up. ● "＊Good-bye＊" will be displayed for 3 seconds, and then the clock will be displayed. ● To re-display the code, switch the power on. "＊Good-bye＊" will be re-displayed, and then after 3 seconds the clock will be displayed and the power will automatically switch off.	 ***U70 CD*** ***＊Good-bye＊***

Display contents

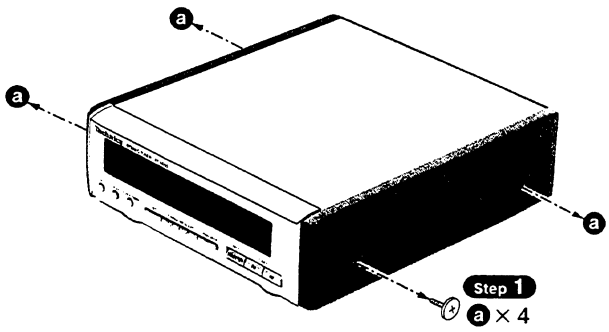
Display code	Problem or condition	Correction procedure
U70 CD (displayed automatically)	A bus-line communications error has occurred as a result of the flat cables being inserted incorrectly, thus preventing the system from operating. 1.If "U70 CD" is displayed on the stereo tuner, the CD Player cannot be operated by remote control.	 1. To check for correct insertion of the flat cables. ①Insert each connector until you hear a click. ②Insert the flat cables at the back of the unit in the order indicated. Make sure the white side of the cable is on your right side.  2. Breakage of flat cable. (Check and replace as necessary.) 3. If the problem is not corrected by items (1.) and (2.) above, this indicates a faulty IC. **ST-HD50/60:** IC901 (M38197MA146F) **SL-HD60:** IC403 (LC66356B4H02) Check these IC's and replace as necessary.
＊Good-bye＊	When the power switch is switched on, it automatically switches back off, making it impossible to switch power on.	● Faulty Stereo Tuner (ST-HD50) output IC (IC501). (When a DC voltage is applied to the speaker terminals.)

■ Operation Checks and Main Component Replacement Procedures

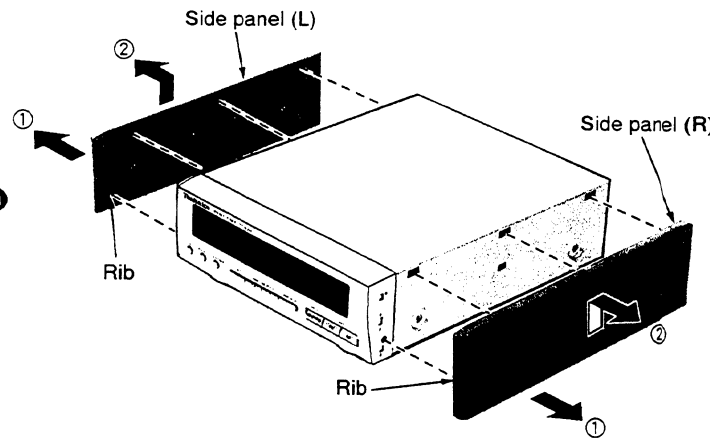
NOTE 1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.

2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

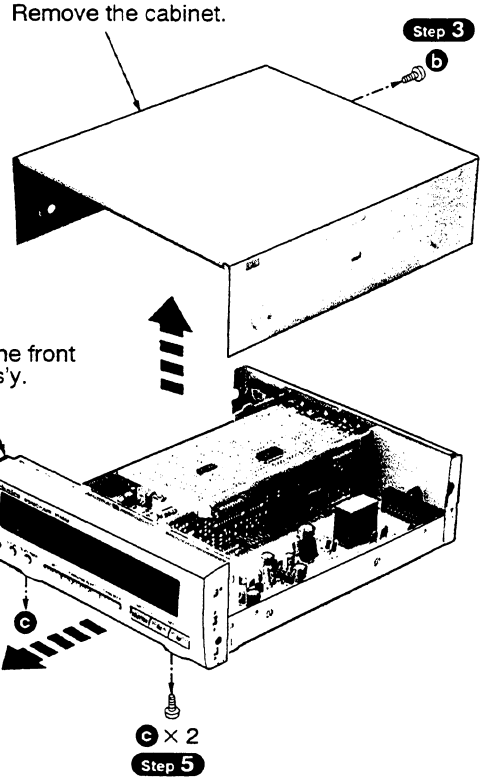
1. Checking for the tuner P.C.B. and FL P.C.B.



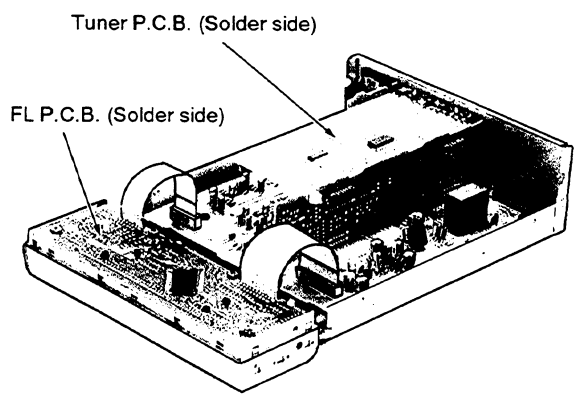
Step 2
Remove the side panel (L),(R).
• Spread the lower part of the side panels in the direction of arrow (➡①) to release the ribs, and then lift to remove the side panels (➡②).



Step 4
Remove the cabinet.

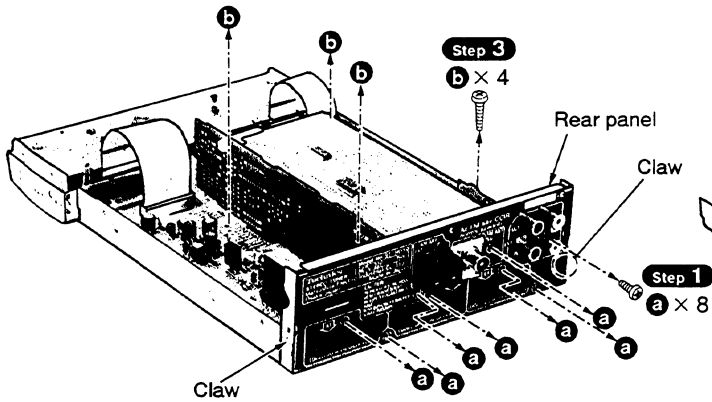


• **Check the tuner P.C.B. and FL P.C.B. as shown below.**



2. Checking for the main P.C.B.

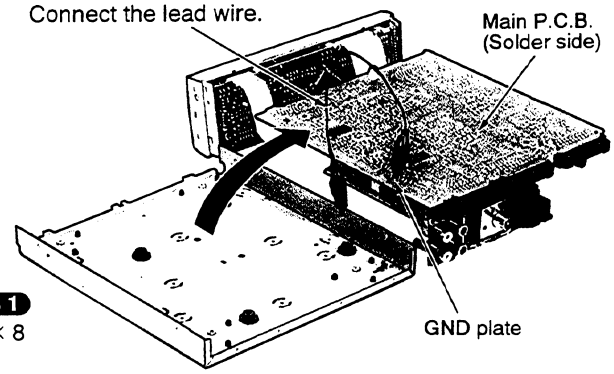
• Follow Step 1 ~ Step 6 in item 1 on page 4.



Step 2
Release the 2 claws, and then remove the rear panel.

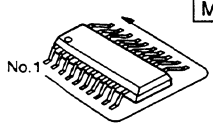
• **Check the main P.C.B. as shown below.**

Step 4
Connect the lead wire.

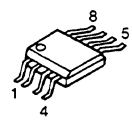


■ Type Illustration of ICs, Transistors and Diodes

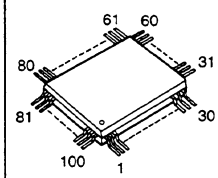
LA1832MH-TEL	24PIN	
LC7218M-TE-L	24PIN	
NJU7313AMT2	30PIN	
M62425FPE1	36PIN	



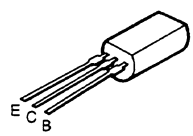
M5218AFPE3
M5219FPTA



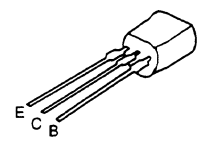
M38197MA146F



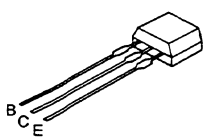
2SC3940AQSTA

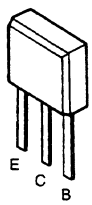


2SB621AQRSTA



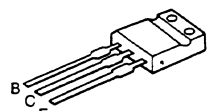
2SD2144STA
DTC143XSTP



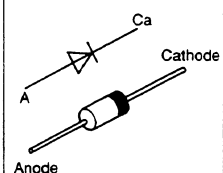


2SA1309AQSTA
2SC2785FETA
2SC2787LTA
2SC3311AQSTA
2SC3311ARSTA
UN4111AITA
UN4115TA
UN4214AITA

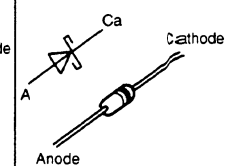
2SB1417PQTA
2SD2137PQTA



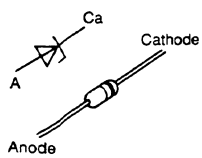
RL1N4003N02



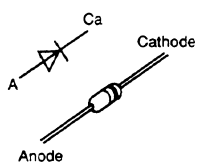
MA719TA

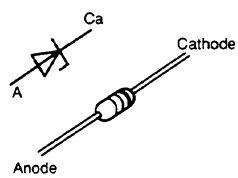


MA4150MTA
MA4300MTA



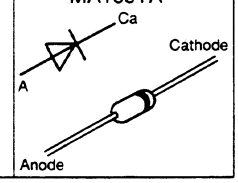
MA185TA





MA4039MTA
MA4051MTA
MA4062HTA
MA4082LTA

1SS291TA
MA165TA



■ To Supply Power Source

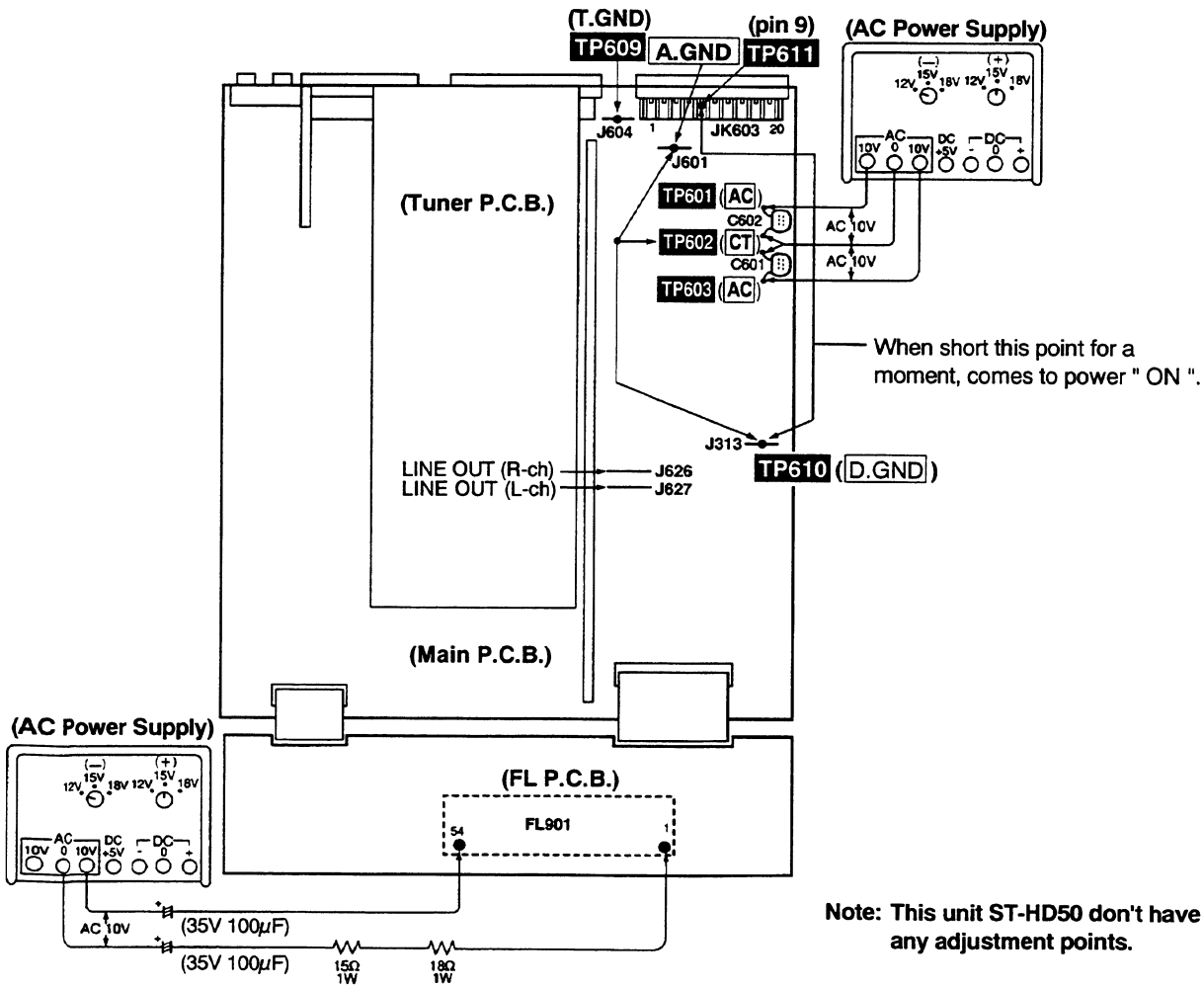
This unit ST-HD50 is designed to operate on power supplied from the Amplifier SE-HD50. When operating the unit ST-HD50 alone for testing and servicing, without having power supplied from the Amplifier SE-HD50, use the following method.

Power Supply to Main Circuit

1. Short the section between the test points TP602 (CT) and TP610 (D.GND), and as well as the section between the test points A. GND (J601) and TP610 (D.GND).
2. Connect the 10 V AC power through the capacitor (35V 100μF) to pin 1 of the indicator module FL901 and the GND terminal through the capacitor (35V 100μF) to pin 57 of the same FL901 module.
3. Apply 10 V AC power to the section between the point TP601 (AC) and the point TP602 (CT) as well as the section between the point TP603 (AC) and the point TP602 (CT). This unit comes to stand-by mode.
4. Short the section between the jumper TP611 (JK603-pin 9) and the point TP610 (D.GND) for a moment. The main circuit comes to power ON mode. (Whenever this operation is performed, power, ON/OFF mode is repeated.)

To Check Signals

Connect the oscilloscope or the speaker with the built-in amplifier to the section between the point J626 [LINE OUT (R-ch)] and the point TP610 (D.GND) as well as the section between the point J627 [LINE OUT (L-ch)] and the point TP610 (D.GND) as shown in Fig. 1, and check if the signals are outputting from this unit.



Note: This unit ST-HD50 don't have any adjustment points.

Fig. 1

■ Schematic Diagram

Page

A TUNER CIRCUIT 8, 9
B CONNECTOR CIRCUIT 10
C INPUT/OUTPUT CIRCUIT 10
D MAIN CIRCUIT ..... 10 ~ 12
E FL CIRCUIT 13, 14
F OPERATION CIRCUIT 14

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

- **S901** : Record timer switch (⏲ REC)
- **S902** : Play timer switch (⏲ PLAY)
- **S903** : Clock/Timer switch (CLOCK/TIMER)
- **S904** : Set switch (SET)
- **S905,906** : Tuning/Time adjust switch (TUNING/TIME ADJUST)
  (S905: DOWN, S906: UP)
- **S907** : Tuning mode select switch (TUNING)
- **S908** : Source input select switch (INPUT SELECTOR)
- **S909** : FM band select switch (TUNER, FM)
- **S910** : AM band select switch (TUNER, AM)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  No mark: Power ON

- Voltage values and waveform are measured as indicated in the schematic diagram when test points between **TP602** and **TP610**, and between **TP610** and **A. GND**, and between **TP609** and **A. GND** are shoted.
  No mark: FM MODE ( ): AM MODE

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

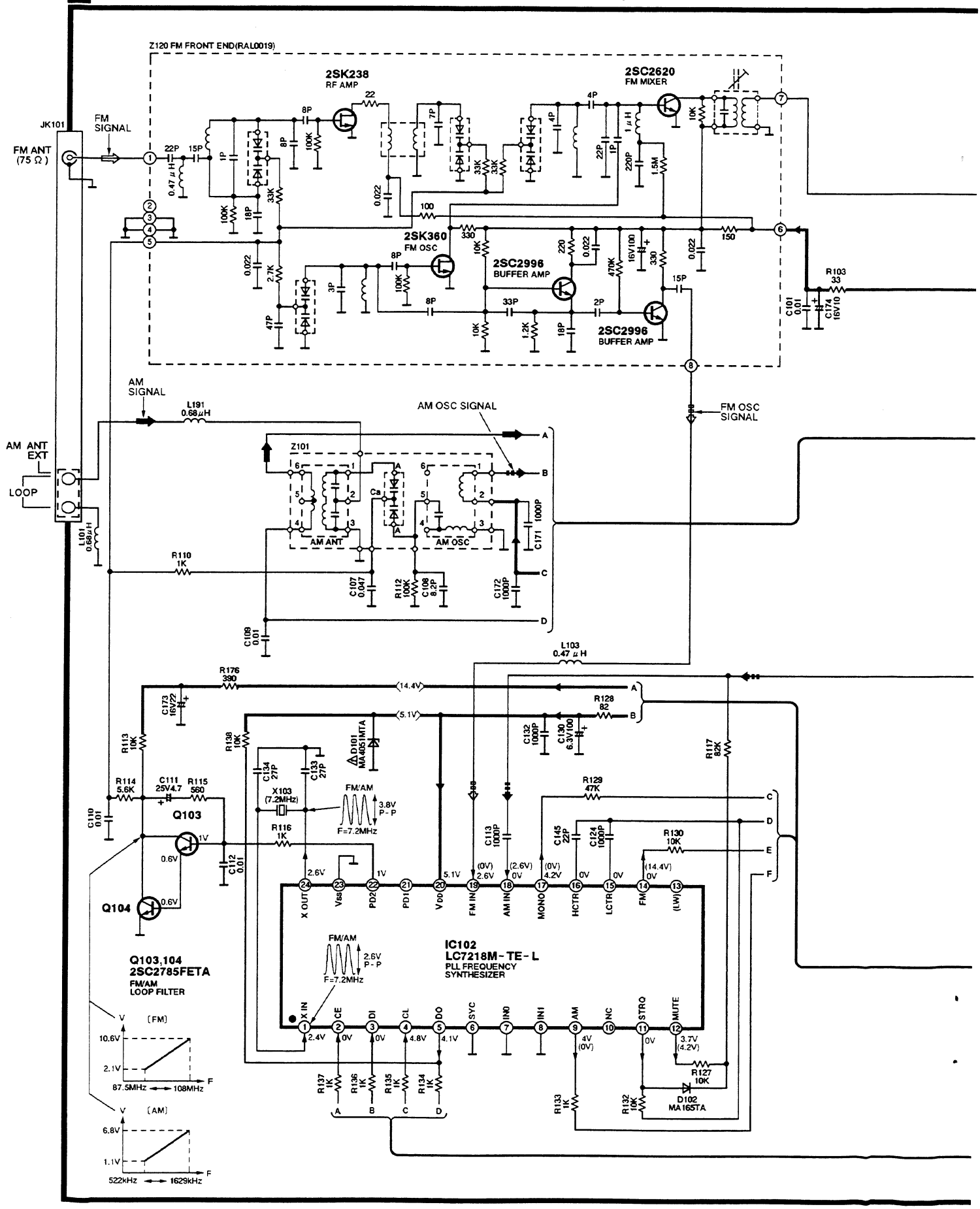
- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**

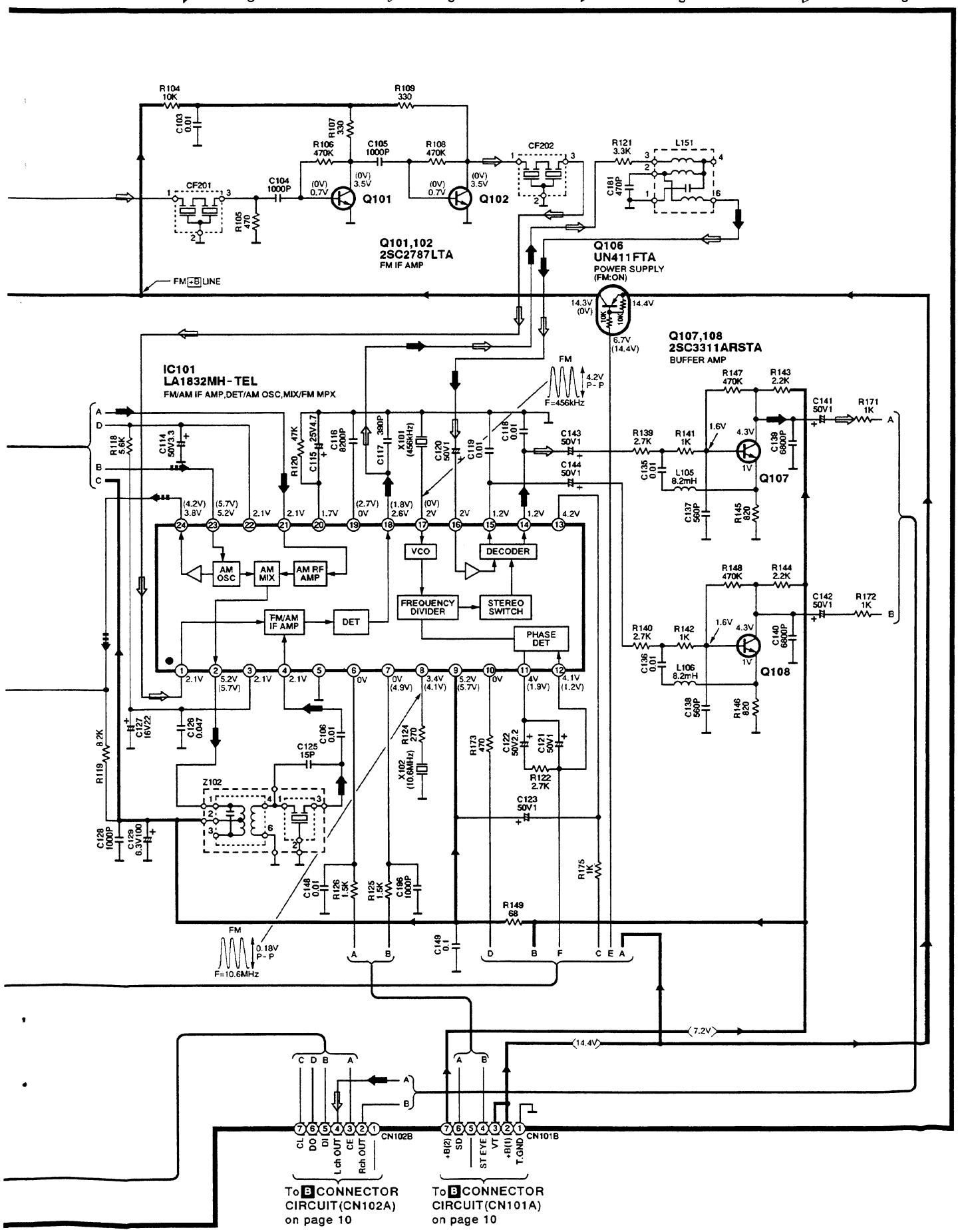
: Positive voltage line
: Negative voltage line
: AM signal line
: FM signal line
: AM OSC signal line
: AM OSC signal line
: REC OUT signal line

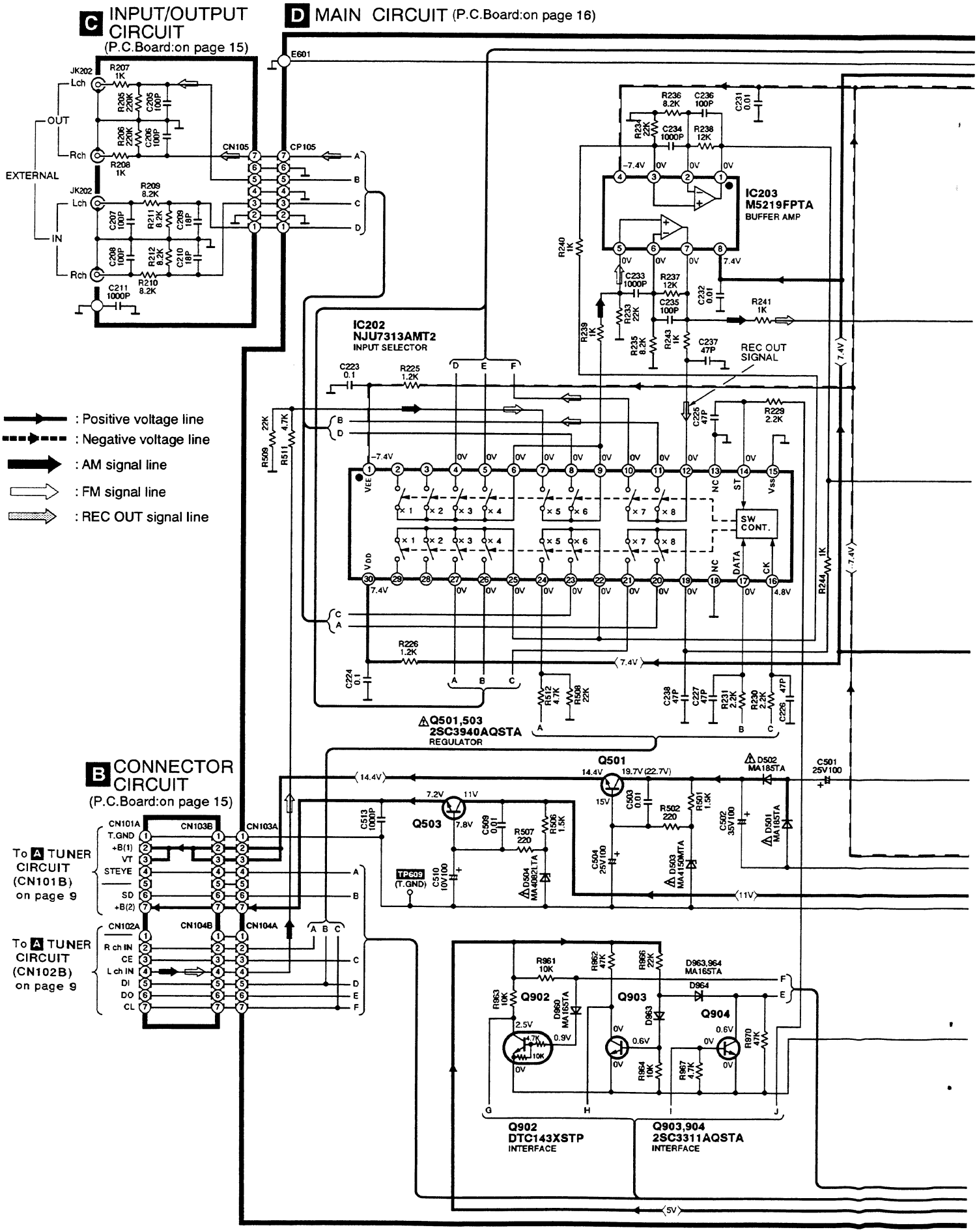
A TUNER CIRCUIT (P.C.Board:on page 15)

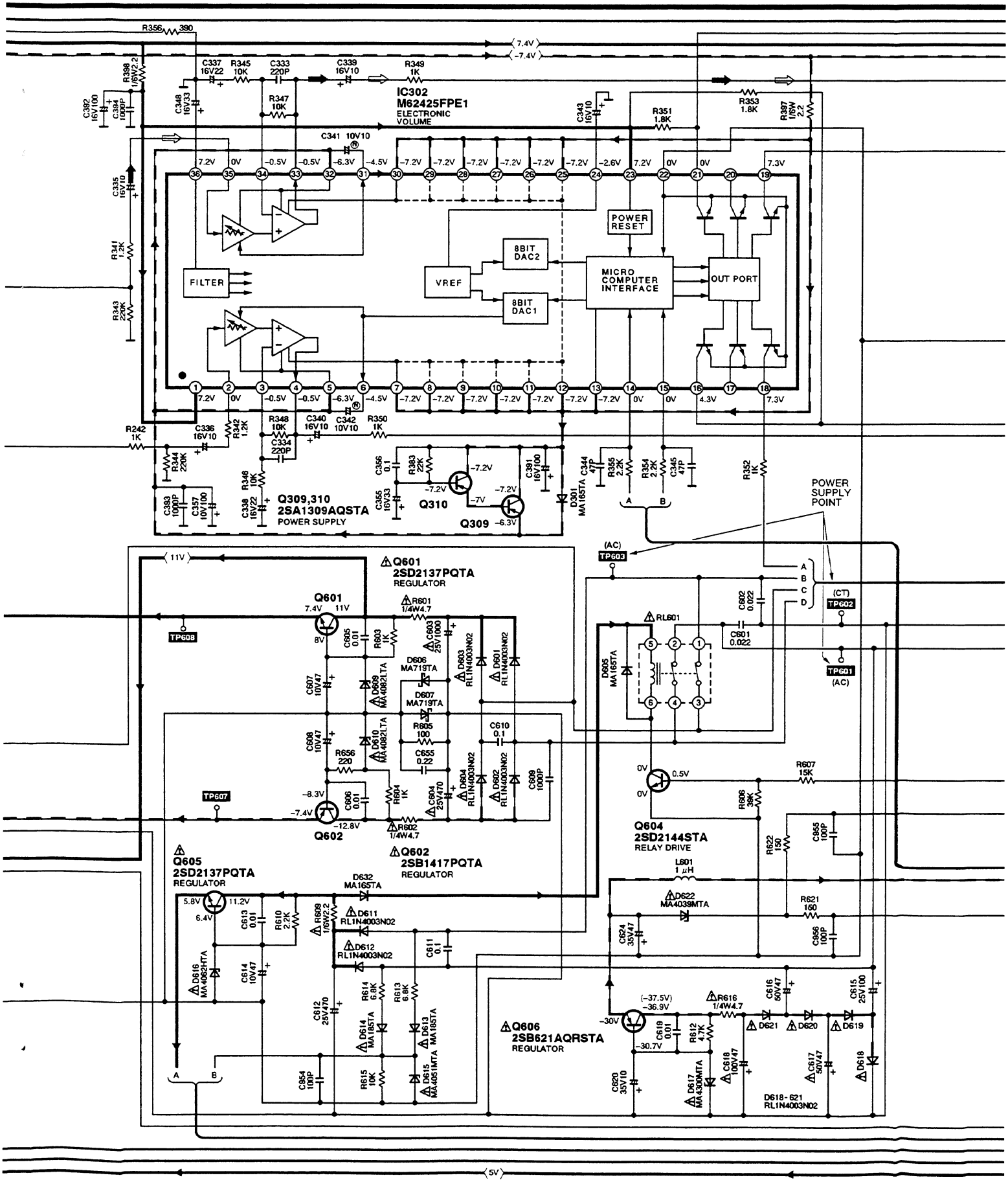
: Positive voltage line



: AM signal line : FM signal line : AM OSC signal line : AM OSC signal line

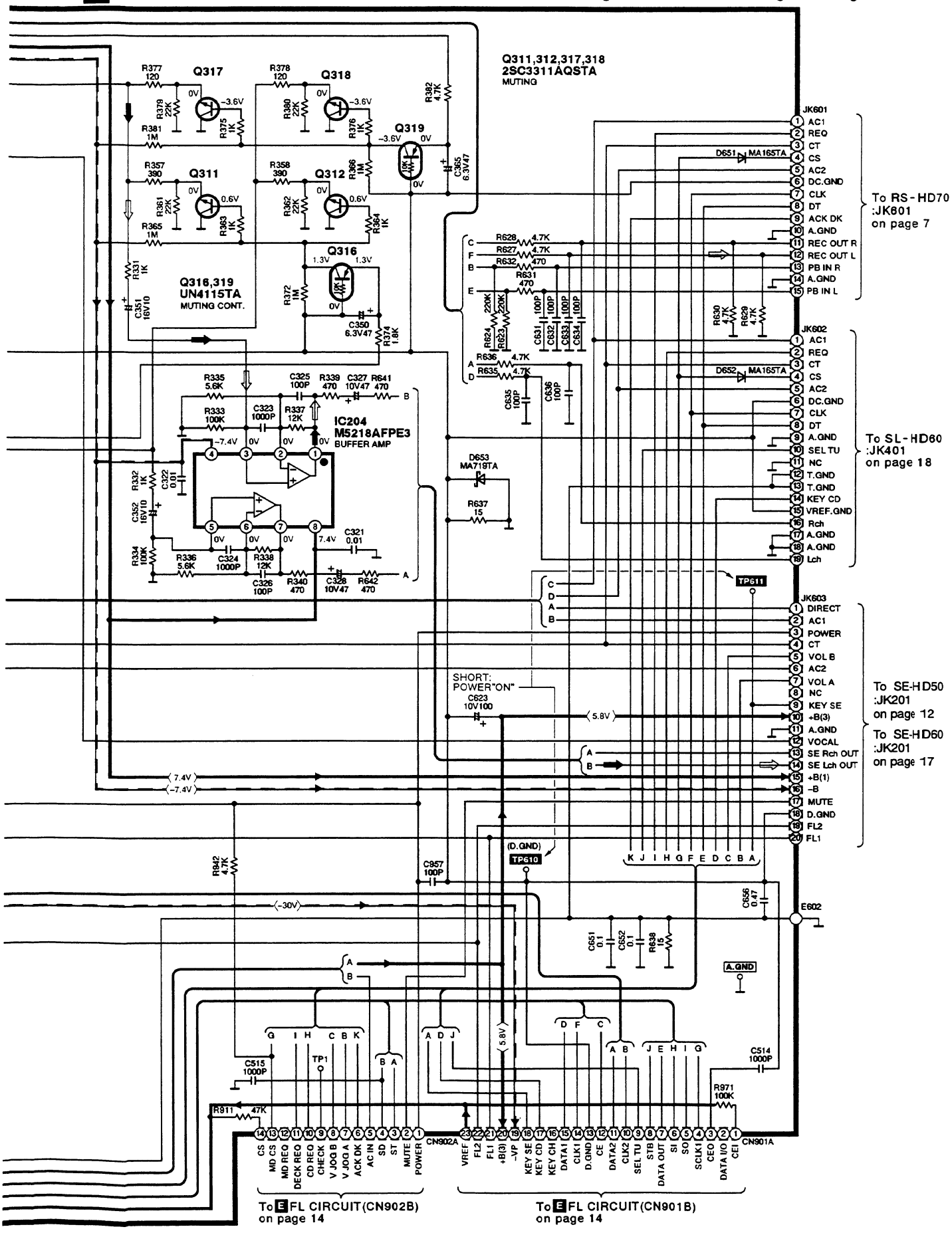



C INPUT/OUTPUT CIRCUIT
(P.C.Board:on page 15)
D MAIN CIRCUIT (P.C.Board:on page 16)
B CONNECTOR CIRCUIT
(P.C.Board:on page 15)
: Positive voltage line
: Negative voltage line
: AM signal line
: FM signal line
: REC OUT signal line
IC202
NJU7313AMT2
INPUT SELECTOR
IC203
M5219FPTA
BUFFER AMP
REC OUT SIGNAL
⚠Q501,503
2SC3940AQSTA
REGULATOR
Q501
Q502
Q503
Q902
Q903
Q904
Q902
DTC143XSTP
INTERFACE
Q903,904
2SC3311AQSTA
INTERFACE
SW CONT.
To A TUNER CIRCUIT (CN101B) on page 9
To A TUNER CIRCUIT (CN102B) on page 9
EXTERNAL
OUT
IN
Lch
Rch
JK202
E601
CN105
CP105
CN101A
CN103B
CN103A
CN102A
CN104B
CN104A
T.GND
+B(1)
VT
STEYE
SD
+B(2)
R ch IN
CE
L ch IN
DI
DO
CL
14.4V
11V
7.4V
5V
0V


IC302
M62425FPE1
ELECTRONIC VOLUME
FILTER
VREF
8BIT DAC2
8BIT DAC1
MICRO COMPUTER INTERFACE
POWER RESET
OUT PORT
Q309,310
2SA1309AQSTA
POWER SUPPLY
Q310
Q309
POWER SUPPLY POINT
Q601
2SD2137PQTA
REGULATOR
Q602
2SB1417PQTA
REGULATOR
Q604
2SD2144STA
RELAY DRIVE
Q605
2SD2137PQTA
REGULATOR
Q606
2SB621AQRSTA
REGULATOR
RL601
L601
1 μH
D618-621
RL1N4003N02

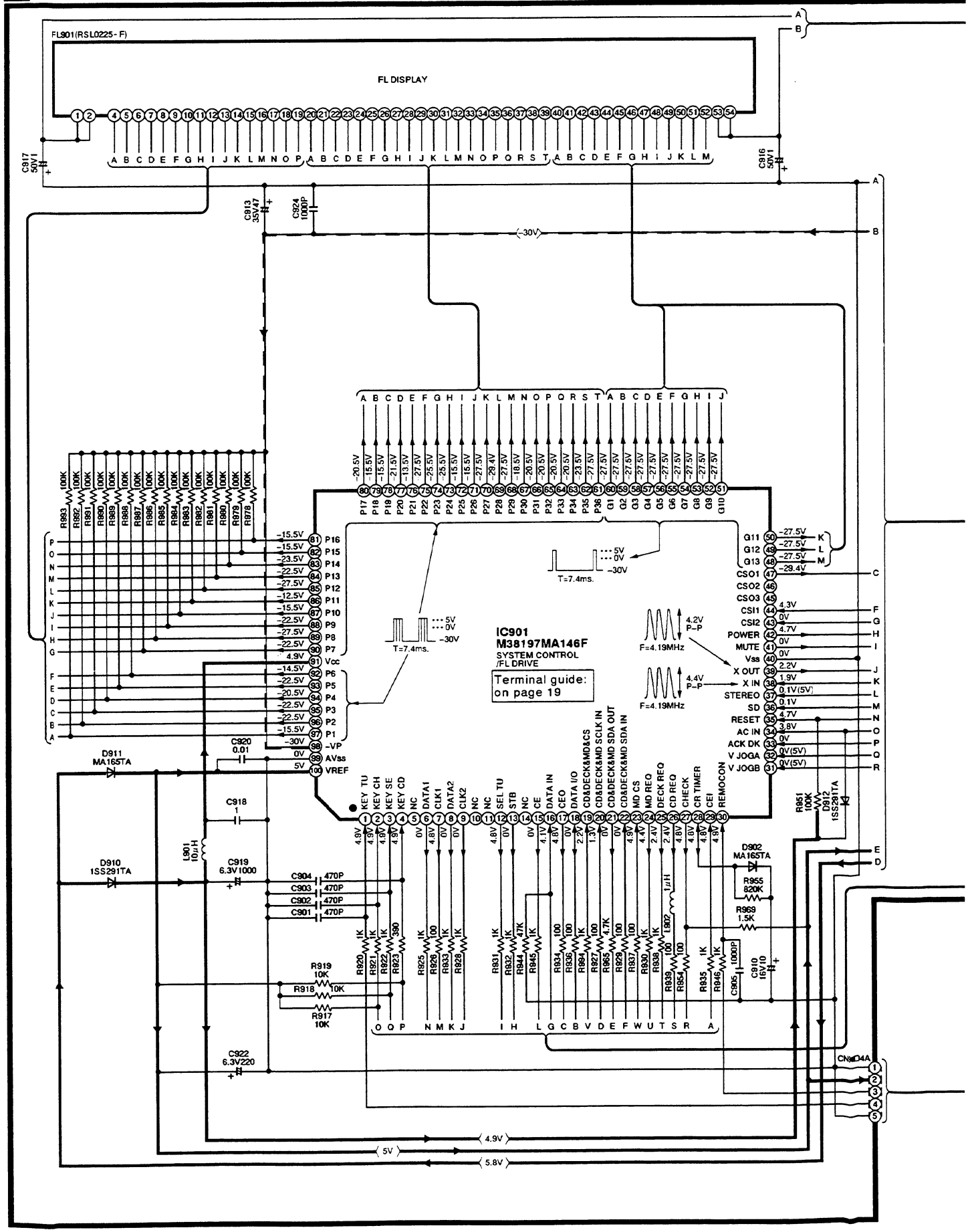
D MAIN CIRCUIT (P.C.Board:on page 16)

: Positive voltage line : Negative voltage line

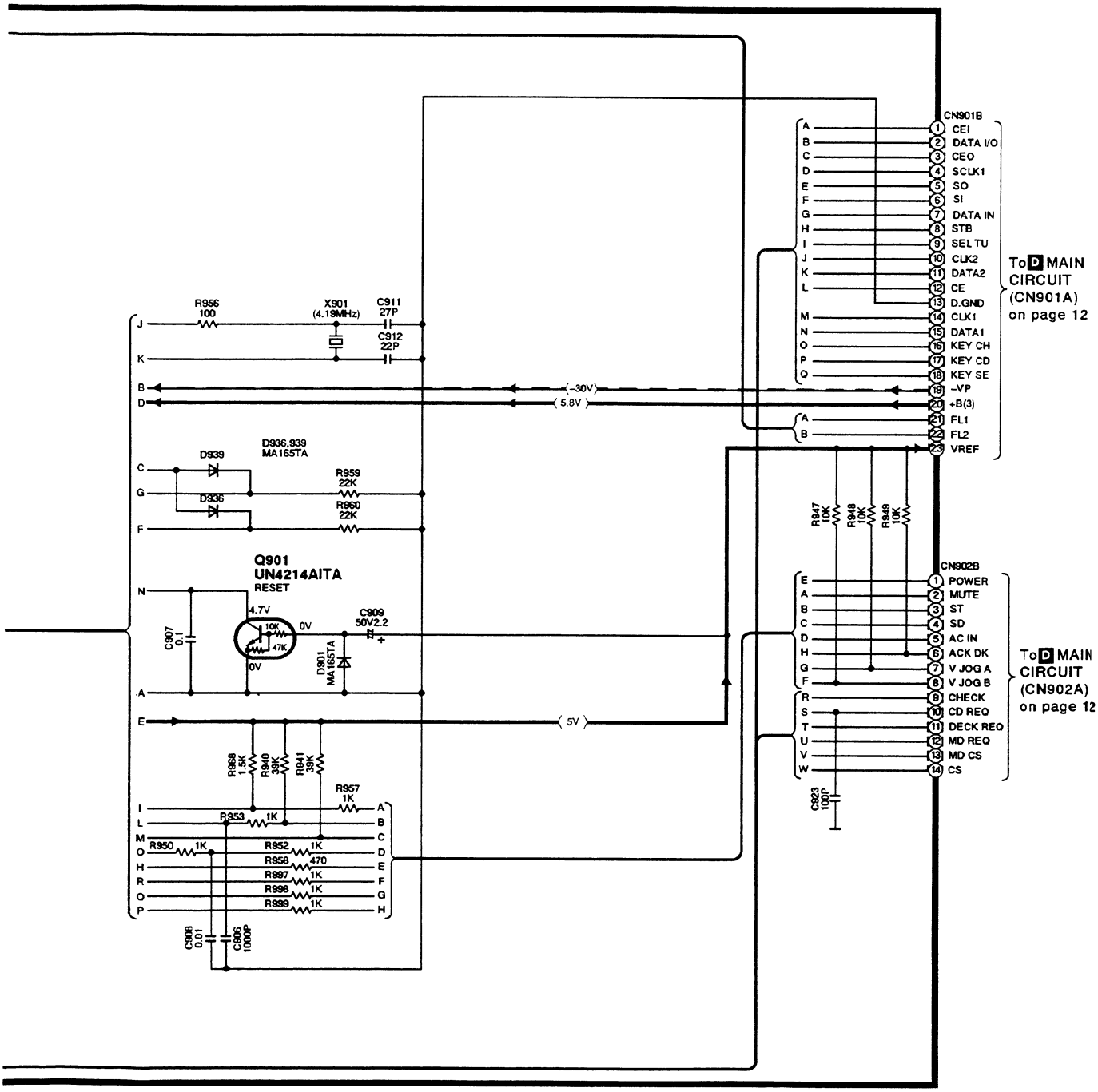


E FL CIRCUIT (P.C.Board:on page 17)

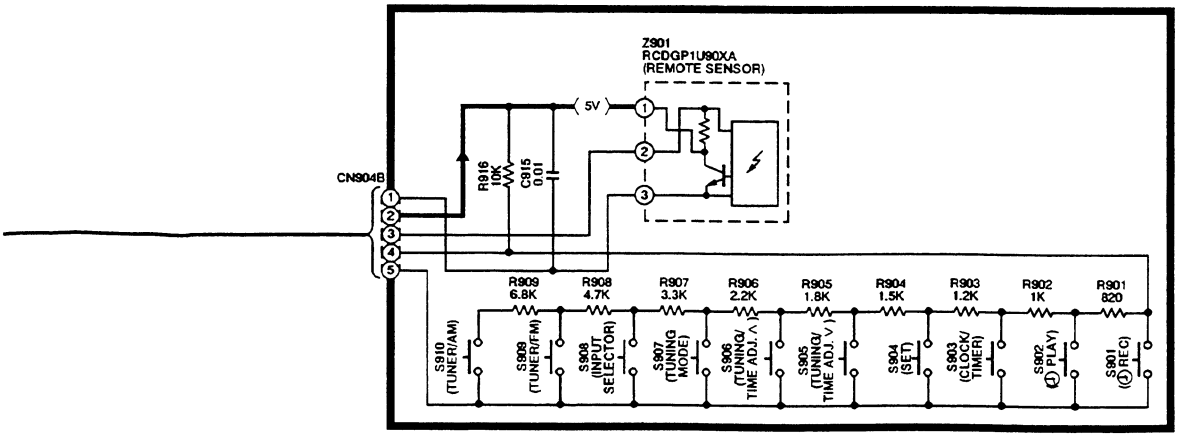
: AM signal line : FM signal line : REC OUT signal line



: Positive voltage line : Negative voltage line



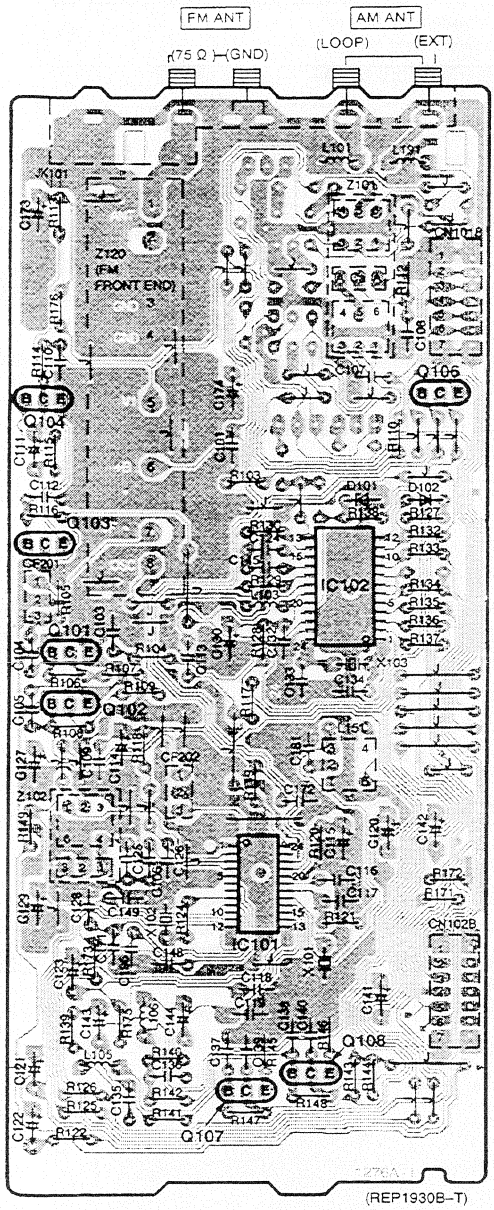
F OPERATION CIRCUIT (P.C.Board:on page 17)



■ Printed Circuit Board Diagram

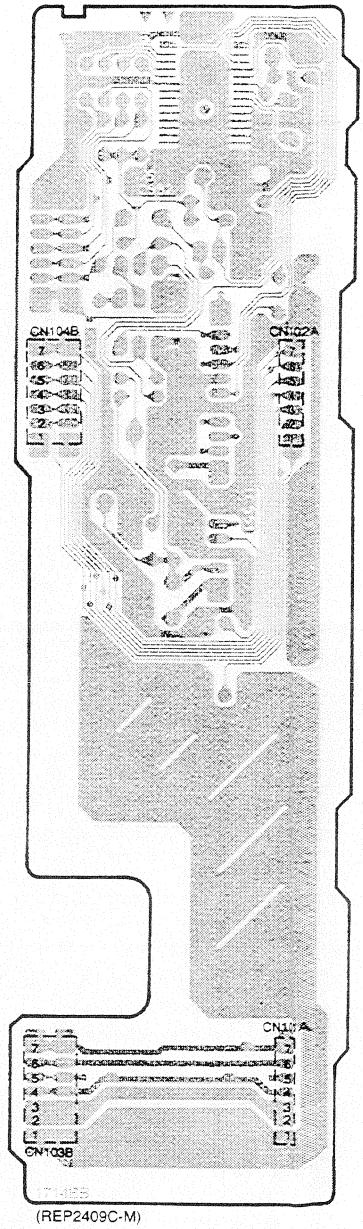
- This circuit board diagram may be modified at any time with the development of new technology.

A TUNER P.C.B.



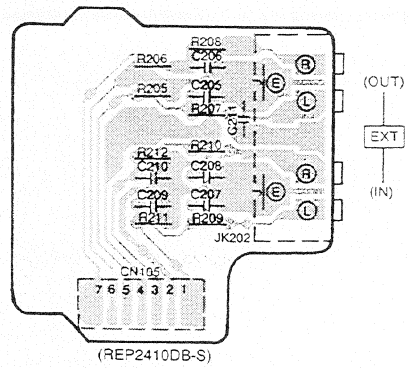
(REP1930B-T)

B CONNECTOR P.C.B.



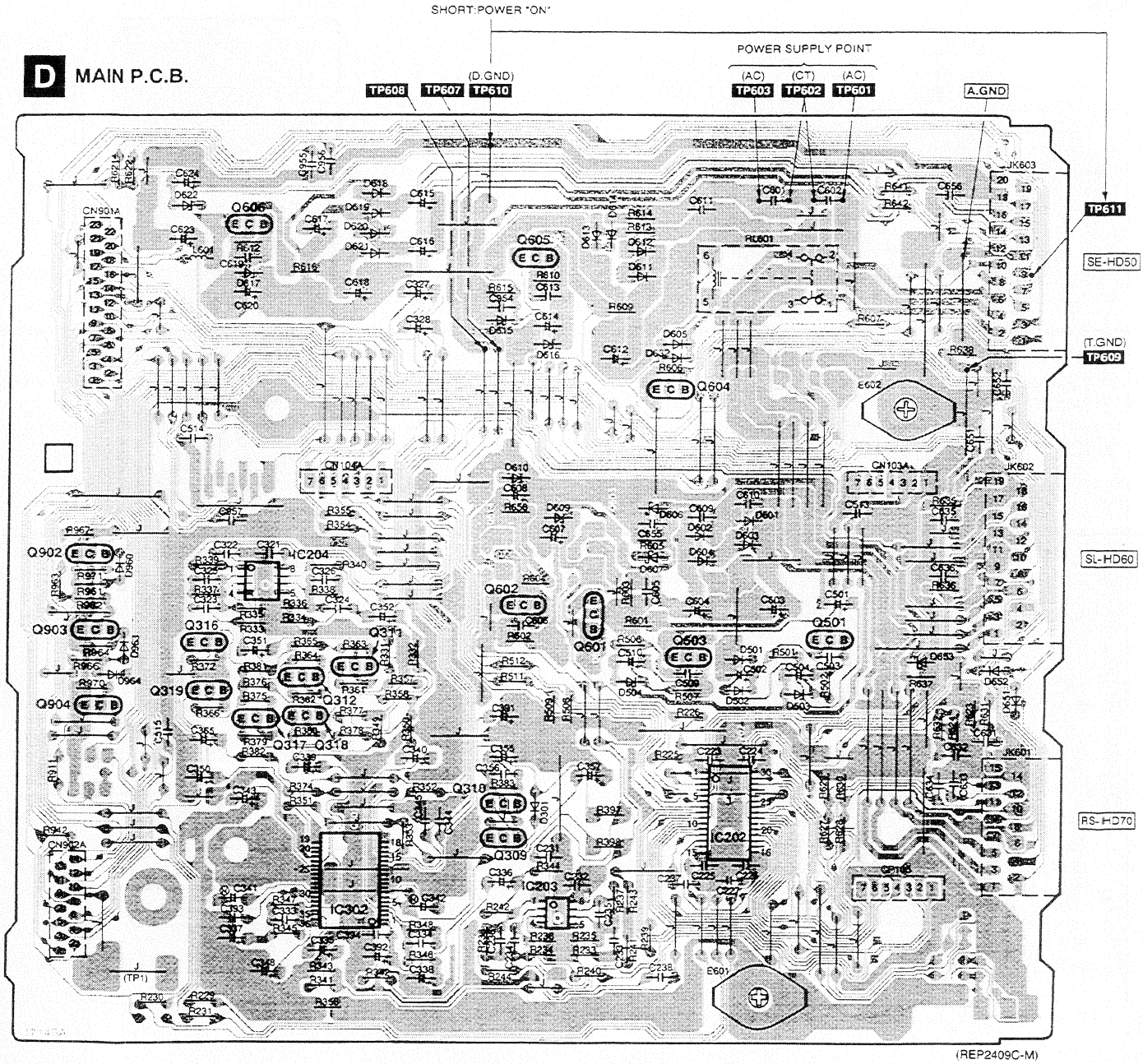
(REP2409C-M)

C INPUT/OUTPUT P.C.B.

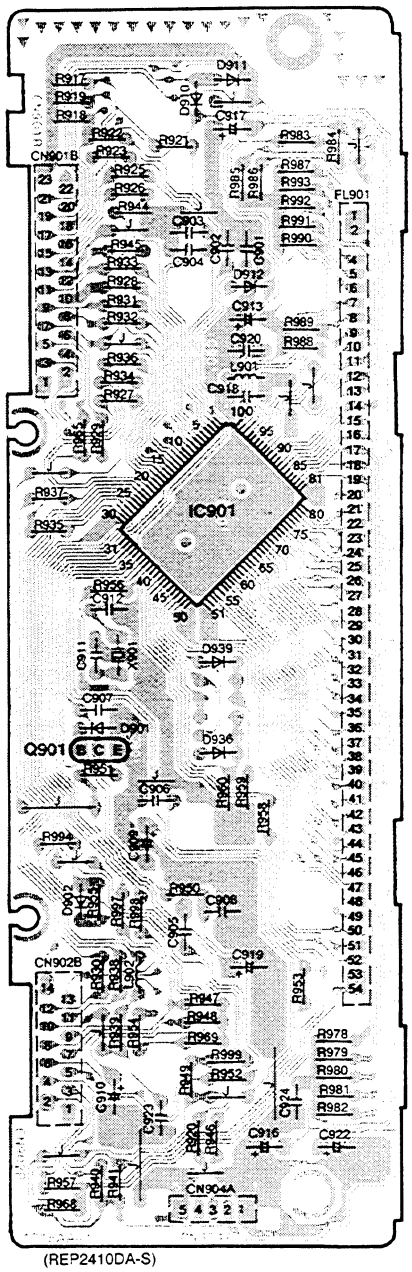


(REP2410DB-S)

D MAIN P.C.B.

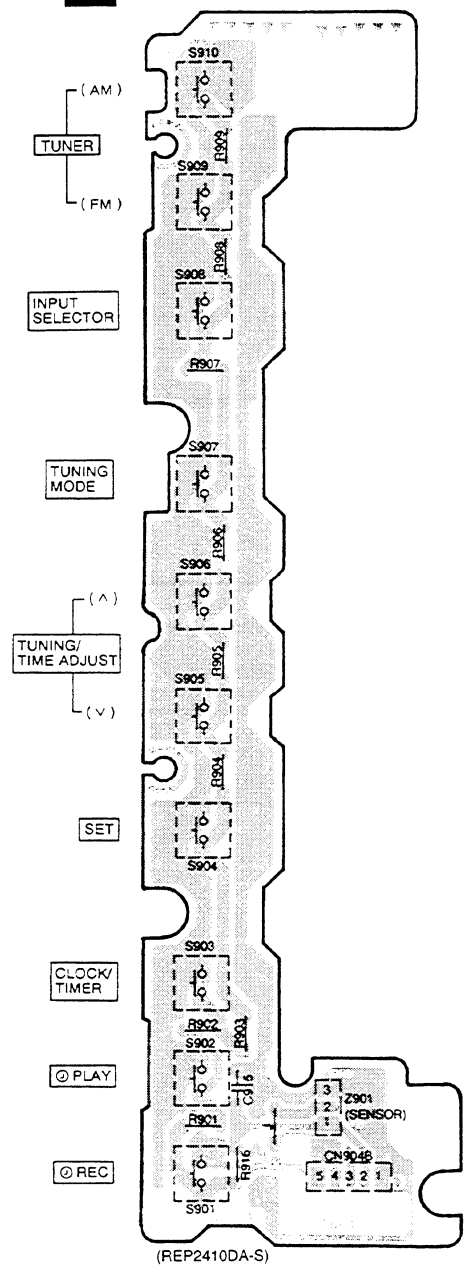

SHORT:POWER "ON"
POWER SUPPLY POINT
(D.GND)
TP608
TP607
TP610
(AC)
(CT)
(AC)
TP603
TP602
TP601
A.GND
TP611
SE-HD50
(T.GND)
TP609
SL-HD60
RS-HD70
Q606
Q605
Q604
Q602
Q601
Q603
Q501
Q902
Q903
Q904
Q316
Q319
Q312
Q317
Q318
Q310
Q309
IC204
IC302
IC203
IC202
CN901A
CN902A
CN103A
JK603
JK602
JK601
(TP1)
(REP2409C-M)

E FL P.C.B.



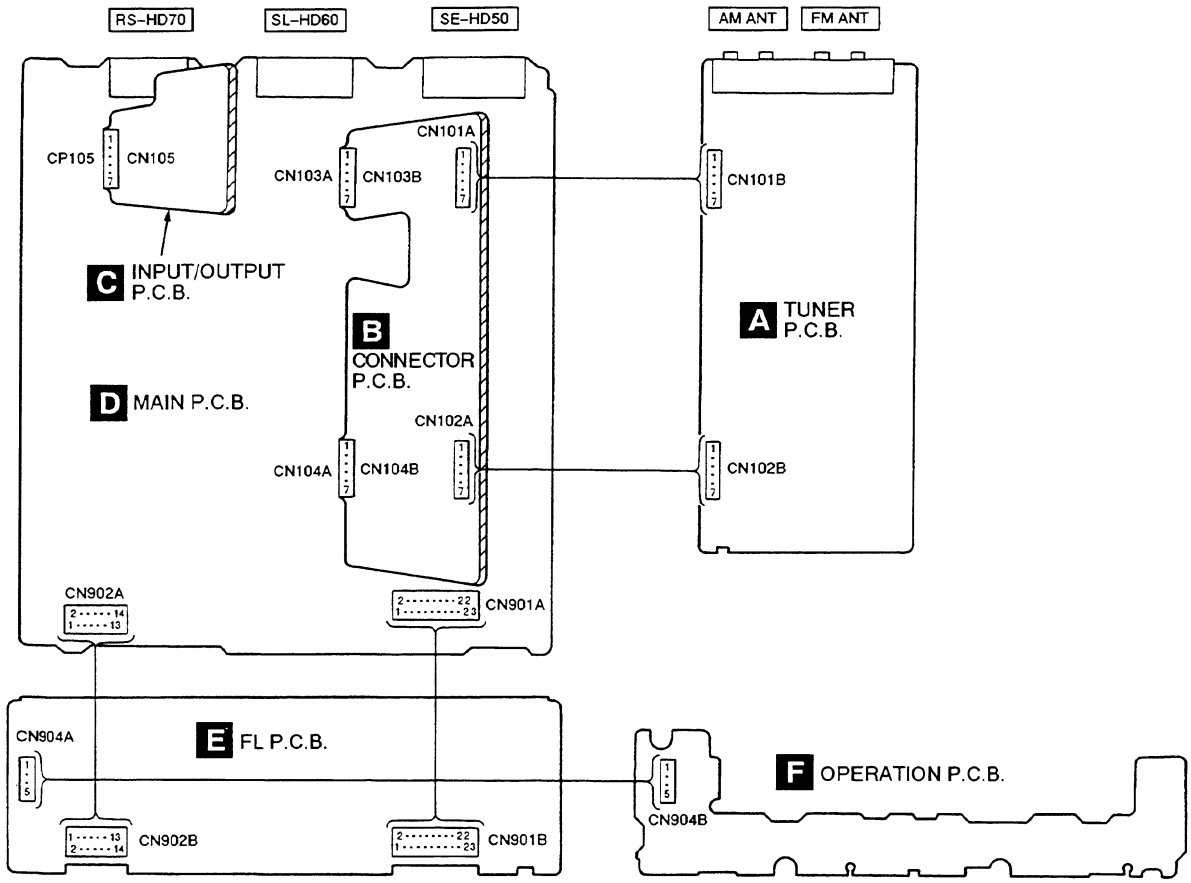
(REP2410DA-S)

F OPERATION P.C.B.



(REP2410DA-S)

■ Wiring Connection Diagram



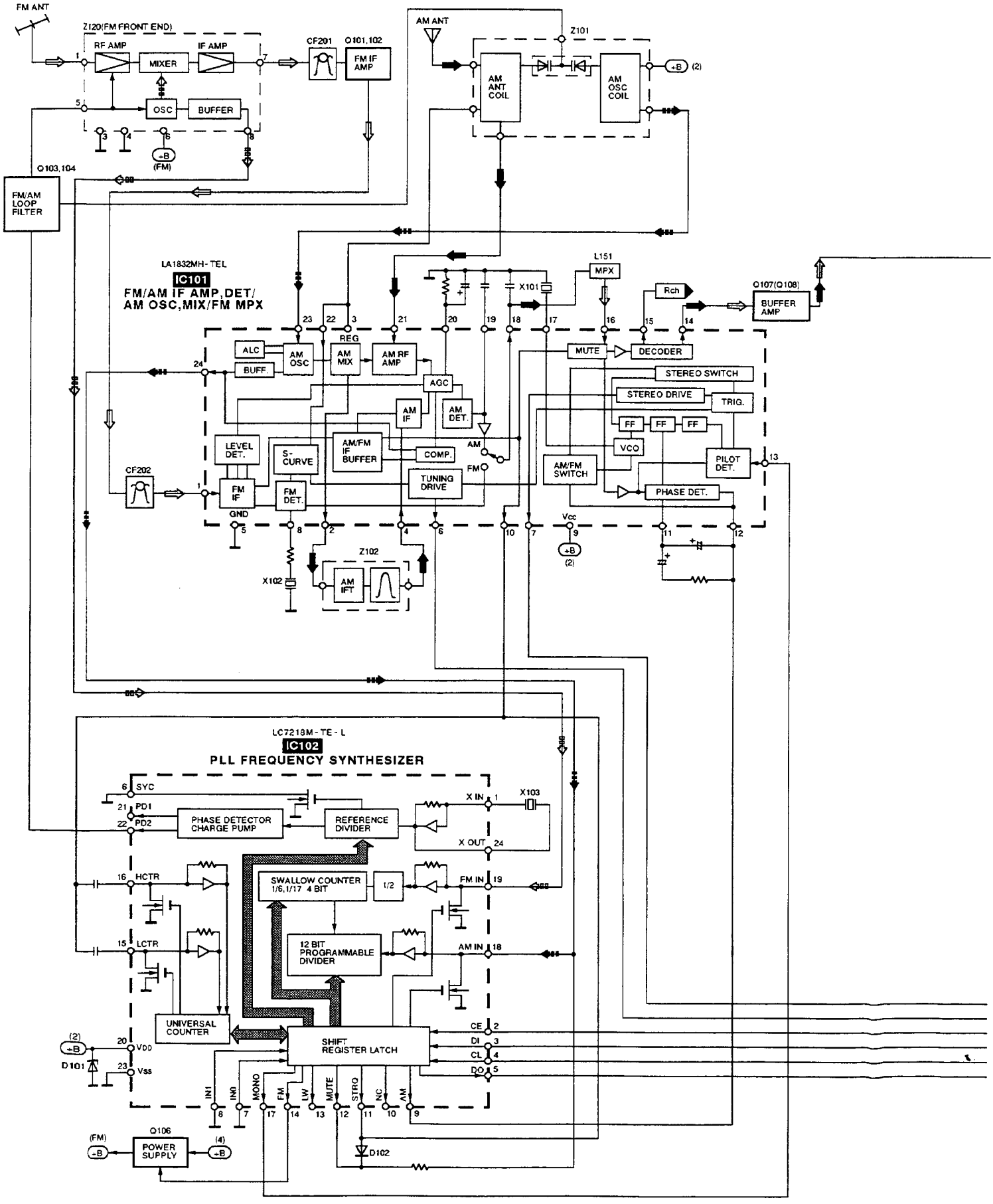
■ Terminal Function of IC's

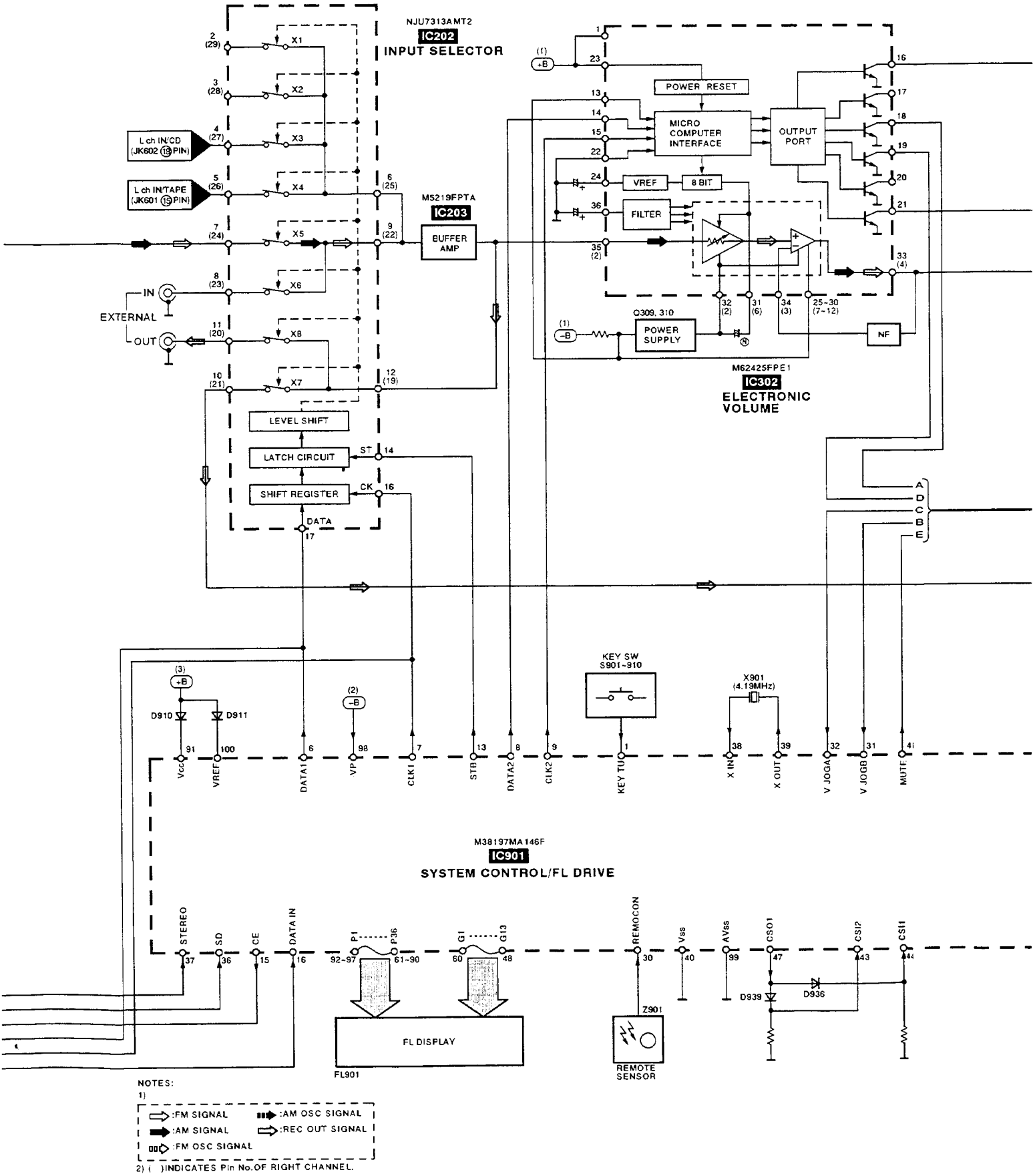
• IC901 (M38197MA146F) : SYSTEM CONTROL/FL DRIVE

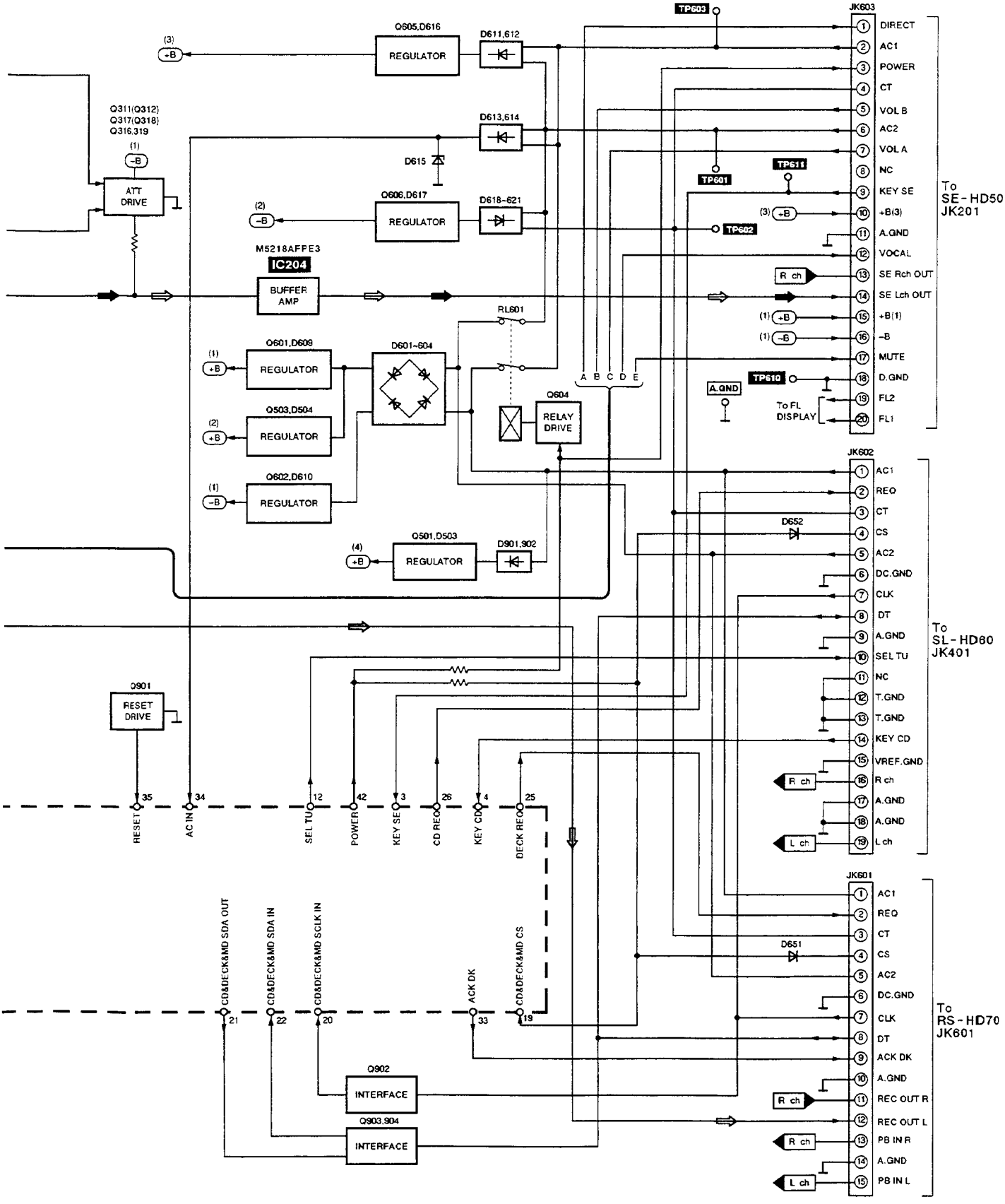
Pin No.	Terminal Name	I/O	Function
1	KEY-TU	I	Tuner operation switch signal input
2	KEY-CH	I	Input selector operation switch signal input
3	KEY-SE	I	SE-HD50 operation switch signal input
4	KEY-CD	I	SL-HD60 operation switch signal input
5	NC	–	Not used, open
6	DATA 1	O	Serial data output terminal
7	CLK 1	O	Serial clock signal output terminal
8	DATA 2	O	Serial data output terminal
9	CLK 2	O	Serial clock signal output terminal
10,11	NC	–	Not used, open
12	SEL-TU	O	Tuner select signal output
13	STB	O	Strobe signal output
14	NC	–	Not used, open
15	CE	O	Chip enable output
16	DATA IN	I	Serial data input terminal
17	CEO	O	Serial data output terminal for (E,EG) areas
18	DATA I/O	I/O	Not used, connected to GND
19	CD & DECK & MD CS	I	Serial data input terminal
20	CD & DECK & MD SCLK IN	I	Serial clock signal input terminal
21	CD & DECK & MD SDA OUT	O	Serial data output terminal
22	CD & DECK & MD SDA IN	I	Serial data input terminal
23	MD CS	I	Chip select signal input for MD
24	MD REQ	O	Request signal output for MD
25	DECK REQ	O	Request signal output for RS-HD70
26	CD REQ	O	Request signal output for SL-HD60
27	CHECK	O	Clock checking terminal
28	CR TIMER	I/O	Capacitor and resistor oscillation terminal
29	CEI	I	Serial data input terminal for (EG) area only
30	REMOCON	I	Remote control signal input
31	V-JOGB	I	Volume control signal input
32	V-JOGA	I	

Pin No.	Terminal Name	I/O	Function
33	ACK DK	I	Serial data input for RS-HD70
34	AC IN	I	AC power in detection signal input
35	RESET	I	Reset signal input
36	SD	I	SD control signal input for tuner circuit
37	STEREO	I	STEREO signal input for tuner circuit
38	XIN	I	Connected to the ceramic oscillator
39	XOUT	O	
40	Vss	–	GND terminal
41	MUTE	O	Muting control signal output
42	POWER	O	Power ON/OFF control signal output
43	CSI 2	I	Connect to GND through the resistor
44	CSI 1	I	
45,46	CSO 3, CSO2	O	Not used, open
47	CSO 1	O	Connect to GND through the diode
48~60	G13 ~ G1	O	Grid control signal output
61~90	P36 ~ P7	O	Segment control signal output
91	VCC	–	Power supply (+5V)
92~97	P6 ~ P1	O	Segment control signal output
98	–VP	–	Negative power supply
99	AVSS	–	Connected to GND
100	VREF	–	Reference voltage input terminal

■ Block Diagram




NJU7313AMT2
IC202
INPUT SELECTOR
L ch IN/CD (JK602 13PIN)
L ch IN/TAPE (JK601 15PIN)
IN
EXTERNAL
OUT
X1
X2
X3
X4
X5
X6
X8
X7
M5219FPTA
IC203
BUFFER AMP
LEVEL SHIFT
LATCH CIRCUIT
SHIFT REGISTER
DATA
ST
CK
POWER RESET
MICRO COMPUTER INTERFACE
OUTPUT PORT
VREF
8 BIT
FILTER
Q309, 310
POWER SUPPLY
NF
M62425FPE1
IC302
ELECTRONIC VOLUME
KEY SW S901~910
X901 (4.19MHz)
D910
D911
M38197MA146F
IC901
SYSTEM CONTROL/FL DRIVE
STEREO
SD
CE
DATA IN
FL DISPLAY
FL901
REMOCON
Z901
REMOTE SENSOR
D939
D936
NOTES:
1)
:FM SIGNAL
:AM SIGNAL
:FM OSC SIGNAL
:AM OSC SIGNAL
:REC OUT SIGNAL
2) ( )INDICATES Pin No.OF RIGHT CHANNEL.


TP603
JK603
Q605,D616
D611,612
REGULATOR
(3) +B
DIRECT
AC1
POWER
CT
VOL B
AC2
VOL A
NC
KEY SE
+B(3)
A.GND
VOCAL
SE Rch OUT
SE Lch OUT
+B(1)
-B
MUTE
D.GND
FL2
FL1
To SE-HD50 JK201
Q311(Q312) Q317(Q318) Q316,319
(1) -B
ATT DRIVE
D613,614
D615
Q606,D617
D618~621
(2) -B
REGULATOR
TP601
TP611
TP602
M5218AFPE3
IC204
BUFFER AMP
RL601
Q601,D609
D601~604
(1) +B
REGULATOR
Q503,D504
(2) +B
REGULATOR
Q602,D610
(1) -B
REGULATOR
A B C D E
Q604
RELAY DRIVE
TP610
A.GND
To FL DISPLAY
JK602
AC1
REQ
CT
CS
AC2
DC.GND
CLK
DT
A.GND
SEL TU
NC
T.GND
T.GND
KEY CD
VREF.GND
R ch
A.GND
A.GND
L ch
D652
To SL-HD60 JK401
(4) +B
Q501,D503
REGULATOR
D901,902
Q901
RESET DRIVE
35 RESET
34 AC IN
12 SEL TU
42 POWER
3 KEY SE
26 CD REQ
4 KEY CD
25 DECK REQ
JK601
AC1
REQ
CT
CS
AC2
DC.GND
CLK
DT
ACK DK
A.GND
REC OUT R
REC OUT L
PB IN R
A.GND
PB IN L
D651
To RS-HD70 JK601
21 CD&DECK&MD SDA OUT
22 CD&DECK&MD SDA IN
20 CD&DECK&MD SCLK IN
33 ACK DK
19 CD&DECK&MD CS
Q902
INTERFACE
Q903,904
INTERFACE

■ Replacement Parts List (Electrical)

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC101	LA1832MH-TEL	IC	[M]
IC102	LC7218M-TE-L	IC	[M]
IC202	NJU7313AMT2	IC	[M]
IC203	M5219FPTA	IC	[M]
IC204	M5218AFPE3	IC	[M]
IC302	M62425FPE1	IC	[M]
IC901	M38197MA146F	IC	[M]
		TRANSISTOR(S)	
Q101, 102	2SC2787L	TRANSISTOR	[M]
Q103, 104	2SC2785FE	TRANSISTOR	[M]
Q106	UN411FTA	TRANSISTOR	[M]
Q107, 108	2SC3311AR	TRANSISTOR	[M]
Q309, 310	2SA1309A-R	TRANSISTOR	[M]
Q311, 312	2SC3311A-Q	TRANSISTOR	[M]
Q316	UN4115	TRANSISTOR	[M]
Q317, 318	2SC3311A-Q	TRANSISTOR	[M]
Q319	UN4115	TRANSISTOR	[M]
Q501⚠	2SC3940AQSTA	TRANSISTOR	[M]
Q503⚠	2SC3940AQSTA	TRANSISTOR	[M]
Q601⚠	2SD2137PQTA	TRANSISTOR	[M]
Q602⚠	2SB1417PQTA	TRANSISTOR	[M]
Q604	2SD2144S	TRANSISTOR	[M]
Q605⚠	2SD2137PQTA	TRANSISTOR	[M]
Q606⚠	2SB621A-R	TRANSISTOR	[M]
Q901	UN4214TA	TRANSISTOR	[M]
Q902	DTC143XSTP	TRANSISTOR	[M]
Q903, 904	2SC3311A-Q	TRANSISTOR	[M]
		DIODE(S)	
D101⚠	MA4051MTA	DIODE	[M]
D102	MA165	DIODE	[M]
D301	MA165	DIODE	[M]
D501, 502⚠	MA185TA	DIODE	[M]
D503⚠	MA4150M	DIODE	[M]
D504⚠	MA4082LTA	DIODE	[M]
D601-604⚠	RL1N4003N02	DIODE	[M]
D605	MA165	DIODE	[M]
D606, 607	MA719TA	DIODE	[M]
D609, 610⚠	MA4082LTA	DIODE	[M]
D611, 612⚠	RL1N4003N02	DIODE	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
D613, 614⚠	MA185TA	DIODE	[M]
D615⚠	MA4051MTA	DIODE	[M]
D616⚠	MA4062-H	DIODE	[M]
D617⚠	MA4300M	DIODE	[M]
D618-621⚠	RL1N4003N02	DIODE	[M]
D622⚠	MA4039MTA	DIODE	[M]
D632	MA165	DIODE	[M]
D651, 652	MA165	DIODE	[M]
D653	MA719TA	DIODE	[M]
D901, 902	MA165	DIODE	[M]
D910	1SS291TA	DIODE	[M]
D911	MA165	DIODE	[M]
D912	1SS291TA	DIODE	[M]
D936	MA165	DIODE	[M]
D939	MA165	DIODE	[M]
D960	MA165	DIODE	[M]
D963, 964	MA165	DIODE	[M]
		COMPONENT COMBINATION(S)	
Z101	RLA2Z002M-T	COMPONENT COMBINATION	[M]
Z102	RLI2Z006M-T	COMPONENT COMBINATION	[M]
Z120	RAL0019	FM FRONT END	[M]
Z901	RCDGP1U90XA	REMOTE SENSOR	[M]
		COIL(S)	
L101	ELESNR68MA	COIL	[M]
L103	ELEXTR47MA9	COIL	[M]
L105, 106	ELELN822KL	COIL	[M]
L151	SLM1B10M-1M	COIL	[M]
L191	ELESNR68MA	COIL	[M]
L601	ELEXT1R0KA9	COIL	[M]
L901	RLQA100JT-Y	COIL	[M]
L902	ELEXT1R0KA9	COIL	[M]
		FILTER(S)	
CF201	RLFFETNGD01L	CERAMIC FILTER	[M]
CF202	RLFFETMGD01L	CERAMIC FILTER	[M]
		OSCILLATOR(S)	
X101	RSXZ456KM07M	OSCILLATOR	[M]
X102	RLFDGT05DD	OSCILLATOR	[M]
X103	RSXC7M20S05T	OSCILLATOR	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
X901	RSXC4M19S02T	OSCILLATOR	[M]
		DISPLAY TUBE	
FL901	RSL0225-F	DISPLAY TUBE	[M]
		SWITCH(ES)	
S901-910	EVQ21405R	SW	[M]
		CONNECTOR(S)	
CN105	RJU057W007	CONNECTOR (7P)	[M]
CN101A	RJT057W007-1	CONNECTOR (7P)	[M]
CN102A	RJT057W007-1	CONNECTOR (7P)	[M]
CN103A	RJT057W007-1	CONNECTOR (7P)	[M]
CN104A	RJT057W007-1	CONNECTOR (7P)	[M]
CN901A	RJS1A6823	CONNECTOR (23P)	[M]
CN902A	RJS1A6814	CONNECTOR (14P)	[M]
CN904A	RJT066H05A	CONNECTOR (5P)	[M]
CN101B	RJU057W007	CONNECTOR (7P)	[M]
CN102B	RJU057W007	CONNECTOR (7P)	[M]
CN103B	RJU057W007	CONNECTOR (7P)	[M]
CN104B	RJU057W007	CONNECTOR (7P)	[M]
CN901B	RJS1A6223-1	CONNECTOR (23P)	[M]
CN902B	RJS1A6214-1	CONNECTOR (14P)	[M]
CN904B	RJU066H05	CONNECTOR (5P)	[M]
CP105	RJT057W007-1	CONNECTOR (7P)	[M]
		GND PLATE	
E601, 602	SNE1004-2	GND PLATE	[M]
		RELAY(S)	
RL601⚠	RSY0017M-0	RELAY	[M]
		JACK(S)	
JK101	RJH5210M	ANT TERMINAL	[M]
JK202	SJF3069-5N	EXT OUT/IN	[M]
JK601	RJT065K15	CONNECTOR(15P)	[M]
JK602	RJT065K19	CONNECTOR(19P)	[M]
JK603	RJT065K20	CONNECTOR(20P)	[M]

■ Resistors and Capacitors

Notes: *Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)
*Resistance values are in ohms, unless specified otherwise, 1K = 1,000 (OHM) 1M = 1,000k (OHM)
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R103	ERDS2TJ330	1/4W 33 [M]
R104	ERDS2TJ103	1/4W 10K [M]
R105	ERDS2TJ471	1/4W 470 [M]
R106	ERDS2TJ474	1/4W 470K [M]
R107	ERDS2TJ331	1/4W 330 [M]
R108	ERDS2TJ474	1/4W 470K [M]
R109	ERDS2TJ331	1/4W 330 [M]
R110	ERDS2TJ102	1/4W 1K [M]
R112	ERDS2TJ104	1/4W 100K [M]
R113	ERDS2TJ103	1/4W 10K [M]
R114	ERDS2TJ562	1/4W 5.6K [M]
R115	ERDS2TJ561	1/4W 560 [M]
R116	ERDS2TJ102	1/4W 1K [M]
R117	ERDS2TJ823T	1/4W 82K [M]
R118	ERDS2TJ562	1/4W 5.6K [M]
R119	ERDS2TJ822	1/4W 8.2K [M]
R120	ERDS2TJ473	1/4W 47K [M]
R121	ERDS2TJ332	1/4W 3.3K [M]
R122	ERDS2TJ272T	1/4W 2.7K [M]
R124	ERDS2TJ271	1/4W 270 [M]
R125, 126	ERDS2TJ152	1/4W 1.5K [M]
R127	ERDS2TJ103	1/4W 10K [M]
R128	ERDS2TJ820	1/4W 82 [M]
R129	ERDS2TJ473	1/4W 47K [M]
R130	ERDS2TJ103	1/4W 10K [M]
R132	ERDS2TJ103	1/4W 10K [M]
R133-137	ERDS2TJ102	1/4W 1K [M]
R138	ERDS2TJ103	1/4W 10K [M]
R139, 140	ERDS2TJ272T	1/4W 2.7K [M]
R141, 142	ERDS2TJ102	1/4W 1K [M]
R143, 144	ERDS2TJ222	1/4W 2.2K [M]
R145, 146	ERDS2TJ821	1/4W 820 [M]
R147, 148	ERDS2TJ474	1/4W 470K [M]
R149	ERDS2TJ680T	1/4W 68 [M]
R171, 172	ERDS2TJ102	1/4W 1K [M]
R173	ERDS2TJ471	1/4W 470 [M]
R175	ERDS2TJ102	1/4W 1K [M]
R176	ERDS2TJ391	1/4W 390 [M]
R205, 206	ERDS2TJ224T	1/4W 220K [M]
R207, 208	ERDS2TJ102	1/4W 1K [M]
R209-212	ERDS2TJ822	1/4W 8.2K [M]
R225, 226	ERDS2TJ122	1/4W 1.2K [M]
R229-231	ERDS2TJ222	1/4W 2.2K [M]
R233, 234	ERDS2TJ223	1/4W 22K [M]
R235, 236	ERDS2TJ822	1/4W 8.2K [M]
R237, 238	ERDS2TJ123	1/4W 12K [M]
R239-244	ERDS2TJ102	1/4W 1K [M]
R331, 332	ERDS2TJ102	1/4W 1K [M]
R333, 334	ERDS2TJ104	1/4W 100K [M]
R335, 336	ERDS2TJ562	1/4W 5.6K [M]
R337, 338	ERDS2TJ123	1/4W 12K [M]
R339, 340	ERDS2TJ471	1/4W 470 [M]
R341, 342	ERDS2TJ122	1/4W 1.2K [M]
R343, 344	ERDS2TJ224T	1/4W 220K [M]
R345-348	ERDS2TJ103	1/4W 10K [M]
R349, 350	ERDS2TJ102	1/4W 1K [M]
R351	ERDS2TJ182	1/4W 1.8K [M]
R352	ERDS2TJ102	1/4W 1K [M]
R353	ERDS2TJ182	1/4W 1.8K [M]
R354, 355	ERDS2TJ222	1/4W 2.2K [M]
R356-358	ERDS2TJ391	1/4W 390 [M]
R361, 362	ERDS2TJ223	1/4W 22K [M]
R363, 364	ERDS2TJ102	1/4W 1K [M]
R365, 366	ERDS2TJ105T	1/4W 1M [M]
R372	ERDS2TJ105T	1/4W 1M [M]
R374	ERDS2TJ182	1/4W 1.8K [M]
R375, 376	ERDS2TJ102	1/4W 1K [M]
R377, 378	ERDS2EJ121	1/4W 120 [M]
R379, 380	ERDS2TJ223	1/4W 22K [M]
R381	ERDS2TJ105T	1/4W 1M [M]
R382	ERDS2TJ472	1/4W 4.7K [M]
R383	ERDS2TJ223	1/4W 22K [M]
R397, 398	ERQ16NKW2R2E	1/6W 2.2 [M]
R501	ERDS2TJ152	1/4W 1.5K [M]
R502	ERDS2TJ221	1/4W 220 [M]
R506	ERDS2TJ152	1/4W 1.5K [M]
R507	ERDS2TJ221	1/4W 220 [M]
R508, 509	ERDS2TJ223	1/4W 22K [M]
R511, 512	ERDS2TJ472	1/4W 4.7K [M]
R601, 602⚠	ERD2FCVJ4R7T	1/4W 4.7 [M]
R603, 604	ERDS2TJ102	1/4W 1K [M]
R605	ERDS2TJ101	1/4W 100 [M]
R606	ERDS2TJ393	1/4W 39K [M]
R607	ERDS2TJ153	1/4W 15K [M]
R609⚠	ERQ16NKW2R2E	1/6W 2.2 [M]
R610	ERDS2TJ222	1/4W 2.2K [M]
R612	ERDS2TJ472	1/4W 4.7K [M]
R613, 614	ERDS2TJ682T	1/4W 6.8K [M]
R615	ERDS2TJ103	1/4W 10K [M]
R616⚠	ERD25FVJ4R7T	1/4W 4.7 [M]
R621, 622	ERDS2TJ151	1/4W 150 [M]
R623, 624	ERDS2TJ224T	1/4W 220K [M]
R627-630	ERDS2TJ472	1/4W 4.7K [M]
R631, 632	ERDS2TJ471	1/4W 470 [M]
R635, 636	ERDS2TJ472	1/4W 4.7K [M]
R637, 638	ERDS2TJ150T	1/4W 15 [M]
R641, 642	ERDS2TJ471	1/4W 470 [M]
R656	ERDS2TJ221	1/4W 220 [M]
R901	ERDS2TJ821	1/4W 820 [M]
R902	ERDS2TJ102	1/4W 1K [M]
R903	ERDS2TJ122	1/4W 1.2K [M]
R904	ERDS2TJ152	1/4W 1.5K [M]
R905	ERDS2TJ182	1/4W 1.8K [M]
R906	ERDS2TJ222	1/4W 2.2K [M]
R907	ERDS2TJ332	1/4W 3.3K [M]
R908	ERDS2TJ472	1/4W 4.7K [M]
R909	ERDS2TJ682T	1/4W 6.8K [M]
R911	ERDS2TJ473	1/4W 47K [M]
R916-919	ERDS2TJ103	1/4W 10K [M]
R920-922	ERDS2TJ102	1/4W 1K [M]
R923	ERDS2TJ391	1/4W 390 [M]
R925	ERDS2TJ102	1/4W 1K [M]
R926, 927	ERDS2TJ101	1/4W 100 [M]
R928	ERDS2TJ102	1/4W 1K [M]
R929	ERDS2TJ101	1/4W 100 [M]
R930-933	ERDS2TJ102	1/4W 1K [M]
R934	ERDS2TJ101	1/4W 100 [M]
R935	ERDS2TJ102	1/4W 1K [M]
R936, 937	ERDS2TJ101	1/4W 100 [M]
R938	ERDS2TJ102	1/4W 1K [M]
R939	ERDS2TJ101	1/4W 100 [M]
R940, 941	ERDS2TJ393	1/4W 39K [M]
R942	ERDS2TJ472	1/4W 4.7K [M]
R944	ERDS2TJ473	1/4W 47K [M]
R945, 946	ERDS2TJ102	1/4W 1K [M]
R947-949	ERDS2TJ103	1/4W 10K [M]
R950	ERDS2TJ102	1/4W 1K [M]
R951	ERDS2TJ104	1/4W 100K [M]
R952, 953	ERDS2TJ102	1/4W 1K [M]
R954	ERDS2TJ101	1/4W 100 [M]
R955	ERDS2TJ824	1/4W 820K [M]
R956	ERDS2TJ101	1/4W 100 [M]
R957	ERDS2TJ102	1/4W 1K [M]
R958	ERDS2TJ471	1/4W 470 [M]
R959, 960	ERDS2TJ223	1/4W 22K [M]
R961	ERDS2TJ103	1/4W 10K [M]
R962	ERDS2TJ473	1/4W 47K [M]
R963, 964	ERDS2TJ103	1/4W 10K [M]
R965	ERDS2TJ472	1/4W 4.7K [M]
R966	ERDS2TJ223	1/4W 22K [M]
R967	ERDS2TJ472	1/4W 4.7K [M]
R968, 969	ERDS2TJ152	1/4W 1.5K [M]
R970	ERDS2TJ473	1/4W 47K [M]
R971	ERDS2TJ104	1/4W 100K [M]

Ref. No.	Part No.	Values & Remarks
R978-993	ERDS2TJ104	1/4W 100K [M]
R994	ERDS2TJ102	1/4W 1K [M]
R997-999	ERDS2TJ102	1/4W 1K [M]
		CAPACITORS
C101	ECBT1C103NS5	16V 0.01U [M]
C103	ECBT1C103NS5	16V 0.01U [M]
C104, 105	ECBT1H102KB5	50V 1000P [M]
C106	ECBT1C103NS5	16V 0.01U [M]
C107	ECBT1H473ZF5	50V 0.047U [M]
C108	ECBT1H8R2KC5	50V 8.2P [M]
C109, 110	ECBT1C103NS5	16V 0.01U [M]
C111	ECEA1EKA4R7B	25V 4.7U [M]
C112	ECBT1C103NS5	16V 0.01U [M]
C113	ECBT1H102KB5	50V 1000P [M]
C114	RCE1HKA3R3BG	50V 3.3U [M]
C115	ECEA1EKA4R7B	25V 4.7U [M]
C116	ECBT1C822KS5	16V 8200P [M]
C117	ECQP1391JZ	100V 390P [M]
C118, 119	ECFR1C103KR	16V 0.01U [M]
C120, 121	ECEA1HKA010B	50V 1U [M]
C122	ECEA1HKA2R2B	50V 2.2U [M]
C123	ECEA1HKA010B	50V 1U [M]
C124	ECBT1H102KB5	50V 1000P [M]
C125	ECBT1H150JC5	50V 15P [M]
C126	ECBT1H473ZF5	50V 0.047U [M]
C127	ECEA1CKA220B	16V 22U [M]
C128	ECBT1H102KB5	50V 1000P [M]
C129, 130	ECEA0JKA101B	6.3V 100U [M]
C132	ECBT1H102KB5	50V 1000P [M]
C133, 134	ECBT1H270JU5	50V 27P [M]
C135, 136	ECBT1C103KS5	16V 0.01U [M]
C137, 138	ECBT1H561KB5	50V 560P [M]
C139, 140	ECBT1C682KR5	16V 6800P [M]
C141-144	ECEA1HKA010B	50V 1U [M]
C145	ECBT1H220JC5	50V 22P [M]
C148	ECBT1C103NS5	16V 0.01U [M]
C149	ECBT1H104ZF5	50V 0.1U [M]
C171, 172	ECBT1H102KB5	50V 1000P [M]
C173	ECEA1CKA220B	16V 22U [M]
C174	RCE1CKA100BG	16V 10U [M]
C181	ECBT1H471KB5	50V 470P [M]
C196	ECBT1H102KB5	50V 1000P [M]
C205-208	ECBT1H101KB5	50V 100P [M]
C209, 210	ECBT1H180J5	50V 18P [M]
C211	ECBT1H102KB5	50V 1000P [M]
C223, 224	ECBT1H104ZF5	50V 0.1U [M]
C225-227	ECBT1H470J5	50V 47P [M]
C231, 232	ECBT1E103ZF	25V 0.01U [M]
C233, 234	ECBT1H102KB5	50V 1000P [M]
C235, 236	ECBT1H101KB5	50V 100P [M]

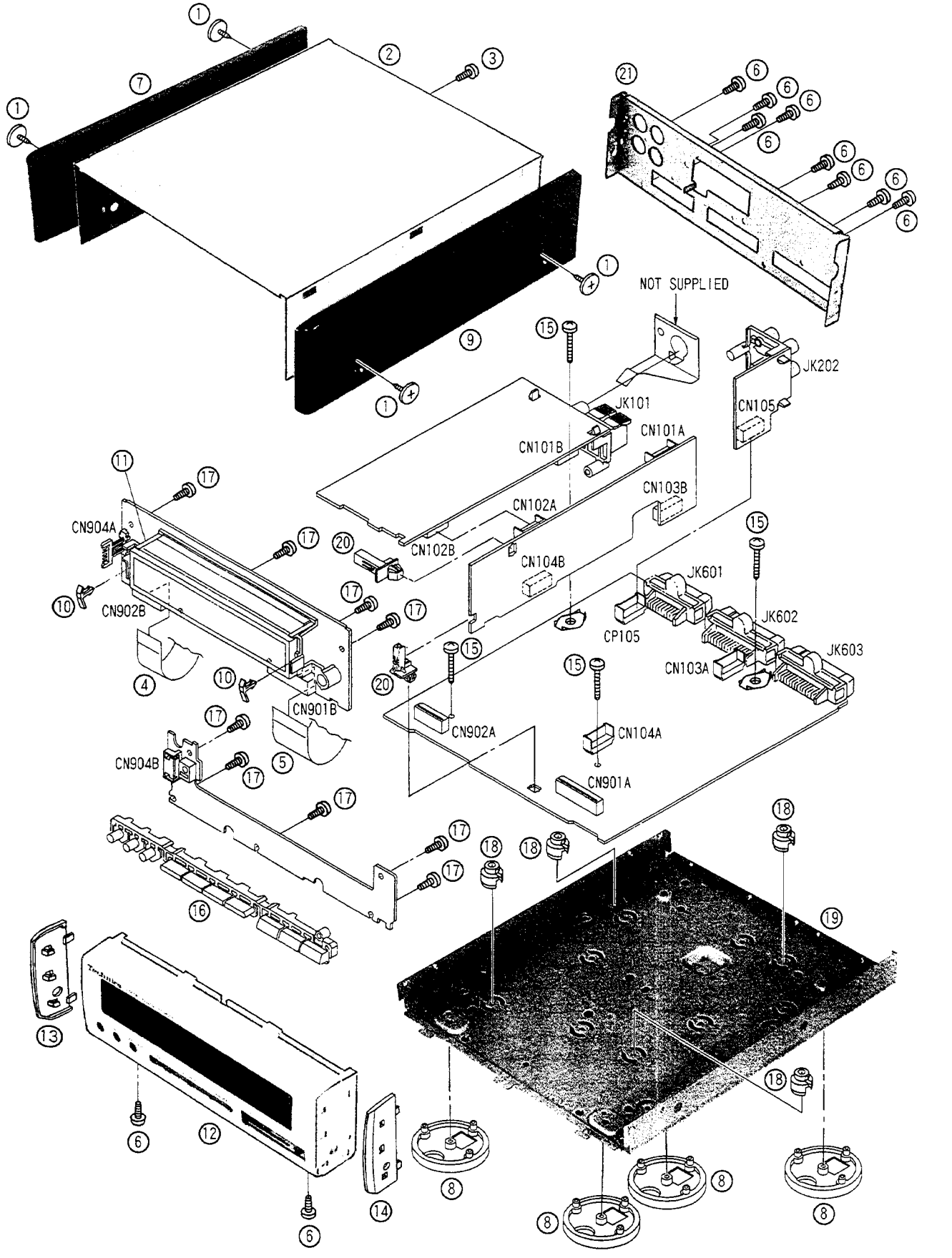
Ref. No.	Part No.	Values & Remarks
C237, 238	ECBT1H470J5	50V 47P [M]
C321, 322	ECBT1E103ZF	25V 0.01U [M]
C323, 324	ECBT1H102KB5	50V 1000P [M]
C325, 326	ECBT1H101KB5	50V 100P [M]
C327, 328	RCE1AKA470BG	10V 47U [M]
C333, 334	ECBT1H221KB5	50V 220P [M]
C335, 336	RCE1CKA100BG	16V 10U [M]
C337, 338	ECEA1CKA220B	16V 22U [M]
C339, 340	RCE1CKA100BG	16V 10U [M]
C341, 342	ECEA1AKN100B	10V 10U [M]
C343	RCE1CKA100BG	16V 10U [M]
C344, 345	ECBT1H470J5	50V 47P [M]
C348	ECEA1CKA330B	16V 33U [M]
C350	ECEA0JKA470B	6.3V 47U [M]
C351, 352	RCE1CKA100BG	16V 10U [M]
C355	ECEA1CKA330B	16V 33U [M]
C356	ECBT1H104ZF5	50V 0.1U [M]
C357	RCE1AKA101BG	10V 100U [M]
C365	ECEA0JKA470B	6.3V 47U [M]
C391, 392	ECEA1CKA101B	16V 100U [M]
C393, 394	ECBT1H102KB5	50V 1000P [M]
C501	ECEA1EKA101B	25V 100U [M]
C502	ECA1VM101B	35V 100U [M]
C503	ECBT1E103ZF	25V 0.01U [M]
C504	ECEA1EKA101B	25V 100U [M]
C509	ECBT1E103ZF	25V 0.01U [M]
C510	RCE1AKA101BG	10V 100U [M]
C513-515	ECBT1H102KB5	50V 1000P [M]
C601, 602	ECKT1H223ZF	50V 0.022U [M]
C603⚠	ECA1EM102B	25V 1000U [M]
C604⚠	RCE1EM471BV	25V 470U [M]
C605, 606	ECBT1E103ZF	25V 0.01U [M]
C607, 608	RCE1AKA470BG	10V 47U [M]
C609	ECBT1H102KB5	50V 1000P [M]
C610, 611	ECBT1H104ZF5	50V 0.1U [M]
C612	RCE1EM471BV	25V 470U [M]
C613	ECBT1E103ZF	25V 0.01U [M]
C614	RCE1AKA470BG	10V 47U [M]
C615	ECEA1EKA101B	25V 100U [M]
C616	ECA1HM470B	50V 47U [M]
C617⚠	ECA1HM470B	50V 47U [M]
C618⚠	ECA2AM470B	100V 47U [M]
C619	ECKR1H103ZF5	50V 0.01U [M]
C620	RCE1VKA100BG	35V 10U [M]
C623	RCE1AKA101BG	10V 100U [M]
C624	ECEA1VKA470B	35V 47U [M]
C631-636	ECBT1H101KB5	50V 100P [M]
C651, 652	ECBT1H104ZF5	50V 0.1U [M]
C655	ECQV1H224JM3	50V 0.22U [M]
C656	ECQV1H474JM3	50V 0.47U [M]
C901-904	ECBT1H471KB5	50V 470P [M]
C905, 906	ECBT1H102KB5	50V 1000P [M]

Ref. No.	Part No.	Values & Remarks
C907	ECBT1H104ZF5	50V 0.1U [M]
C908	ECBT1E103ZF	25V 0.01U [M]
C909	ECEA1HKA2R2B	50V 2.2U [M]
C910	RCE1CKA100BG	16V 10U [M]
C911	ECBT1H270JU5	50V 27P [M]
C912	ECBT1H220GC5	50V 22P [M]
C913	ECEA1VKA470B	35V 47U [M]
C915	ECBT1E103ZF	25V 0.01U [M]
C916, 917	ECEA1HKA010B	50V 1U [M]
C918	ECBT1C105ZF5	16V 1U [M]
C919	RCE0JU102BV	6.3V 1000U [M]
C920	ECBT1E103ZF	25V 0.01U [M]
C922	ECEA0JKA221B	6.3V 220U [M]
C923	ECBT1H101KB5	50V 100P [M]
C924	ECBT1H102KB5	50V 1000P [M]
C954-957	ECBT1H101KB5	50V 100P [M]

■ Replacement Prats List (Cabinet)

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	RHD30073-K	SCREW	[M]
2	RKM0327-S	CABINET	[M]
3	XTB3+8JFZ	SCREW	[M]
4	REZ0883	FFC(14P)	[M]
5	REZ0944	FFC(21P)	[M]
6	XTBS3+8JFZ1	SCREW	[M]
7	RGK0817-M	SIDE PANEL(L)·1	[M]
8	RKA0076-N	FOOT	[M]
9	RGK0818-M	SIDE PANEL(R)·1	[M]
10	RMN0195	STOPPER	[M]
11	RMN0381	FL HOLDER	[M]
12	RFKGTHD50EN	FRONT PANEL ASS'Y	[M]
13	RGK0819-N	SIDE PANEL(L)·2	[M]
14	RGK0820-N	SIDE PANEL(R)·2	[M]
15	XTB3+12JFZ	SCREW	[M]
16	RGU1394-S	BUTTON, OPERATION	[M]
17	XTBS26+8J	SCREW	[M]
18	SHE170-2	PCB SUPPORT	[M]
19	RMK0324-1	CHASSIS	[M]
20	RMN0203	HOLDER	[M]
21	RGR0242B-E	REAR PANEL	[M]

■ Cabinet Parts Location



F970207500KH/HY

printed & distributed by Schaltungsdienst Lange Berlin